United Nations ECE/CES/GE.20/2014/11

Economic and Social Council

Distr.: General
25 February 2014

Original: English

Economic Commission for Europe

Conference of European Statisticians
Group of Experts on National Accounts
Thirteenth session
Geneva, 6-9 May 2014
Item 7 of the provisional agenda
Globalization and national accounts: accounting for global production

2008 Global manufacturing production: Main results for Mexico

Note prepared by the General Directorate of Economic Statistics of National Institute of Statistics, Geography and Informatics of Mexico

Summary

This paper presents the work of the National Institute of Statistics, Geography and Informatics on measuring activities of global manufacturers in Mexico. The work was accomplished in the frame of a project on rebasing the national accounts of Mexico to the year 2008 and the development of the Supply and Use Tables and Input-Output Tables. The results are presented in supplementary Supply and Use tables for 2008, tabulated by industry under the North American Industry Classification System 2007 (NAICS 2007). The paper will introduce the methodology and main results in measuring of global manufacturing production and the value added content in global manufacturing exports.

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I. Introduction

1. Nowadays, official statistics must address new issues such as the emergence of new practices due to the emerging of new forms of entrepreneurial management. Production arrangements have gradually been modified and goods are not produced in just one country any more, while exports increasingly incorporate intermediate inputs provided from abroad, complicating the measurement of the real contribution of exports and value added to the economy, either in terms of income or employment.

2. Acknowledging the need of new basic data and of new forms of measurement in derived statistics, the National Institute of Statistics and Geography (INEGI, Spanish acronym) presented for the first time the economic activity of global manufacturing in supplementary Supply-Use tables for the year 2008. The data was presented by activity using the 2007 North American Industrial Classification System (2007 NAICS).

3. The work was accomplished in the frame of a project for rebasing the national accounts of Mexico to the base year 2008 and elaboration of Supply-Use Tables (SUT) and the Input-Output Tables (IOT). The methodological documents and the results about the Value Added Content of Global Manufacturing in Exports (VACGME) are publicly available. The purpose is to provide better information and measurement of the contribution of the manufacturing sector exports and the value added it generates in the economy, both in terms of income and employment.

4. Sections II and III describe general and methodological aspects about the treatment of the Global Manufacturing Production (GMP) and the measurement of VACGME. Section IV presents the main findings. More detailed results and tables are presented in the annex.

II. General aspects

5. The objective of the project was to measure the value of Global Manufacturing Production, the Value Added Content in Global Manufacturing Exports (VACGME) and the Gross Value Added that global manufacturing activities generate in the economy. The project focused on the manufacturing sector and the geographical coverage was at national level. The data refer to the year 2008.

6. The information published in this document presents the results from the measurement of VACGME for the manufacturing branches that participate in Global Value Chains (GVC). It also shows their contribution to the value added generated by the Mexican economy.

III. Methodological aspects

7. This section will focus on the definition of VACGME and the calculation methods. The VACGME is the value added contributed by an economy to the total value of exported products, which are part of global production processes i.e. are manufactured in different countries. These activities are part of GVC.

8. For the total economy VACGME could be measured in two ways:

- Method 1: Adding the Intermediate Consumption (IC) of Domestic Origin and the Gross Value Added of global manufacturing.

- Method 2: The difference between Exports and Imports, of global manufacturing.

9. Generally speaking there are two types of companies involved in global manufacturing: unaffiliated firms participating in GVC and companies that are part of Multinational Enterprises (MNE). Taking into account the available statistical information and infrastructure, three main criteria were established to identify these companies:

(a) Identify the firms whose inputs are provided mainly from abroad and whose outputs are for export markets (their imports account for a minimum of 2/3 of the value of their exports).

(b) Locate the firms with major participation of foreign capital, because these could be controlled by a foreign headquarters and/or participate in GVC.

(c) Identify the mainly exporting firms (not considered in the previous two points), also the type of good exported, where the intermediate goods are defined as a part of the GVC.

10. It has to be emphasized that different data sources have to be incorporated in order to construct a database of companies engaged in global manufacturing. The company incorporation register and the federal tax records were used to establish a link between the customs records and the respective statistical survey data on manufacturing establishments in order to obtain the following:

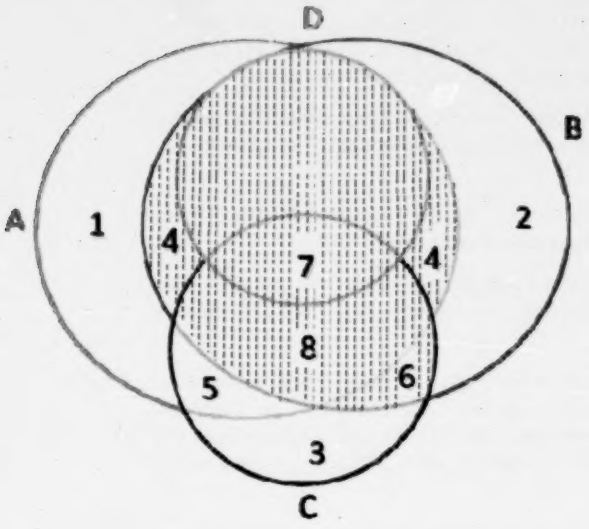
- Foreign Trade Statistics that allow identification of the companies meeting the established criteria and provide information for measuring the VACGME.
- Identify the 2007 NAICS codes assigned by the economic census for the economic production units

A. Implementation of the criteria

11. Figure 1 presents the merchandise transactions between resident economic units and abroad, also the types of units that realize such transactions. It allows illustrating the procedure used to identify the firms that meet the three criteria listed above.

12. The figure shows the economic units that import goods in the domestic economy (set A), and the economic units that export goods to foreign markets (set B).

Figure 1.
Transactions and Manufacturing Firms



Where:
A = importers
1 = units importers output for domestic market
B = exporters
2 = units using domestic inputs and output for exporting (not global)
C = economic units major foreign capital participation
3 = economic units major foreign capital participation engaged in non-manufacturing sectors
D = economic units using imported inputs (import inputs accounts for a minimum of 2/3 of their exports) and exporting output
4 = other economic units exporting output (imported inputs is less than 2/3 of their exported production)
5 = economic units with major foreign capital participation, importers only
6 = economic units with major foreign capital participation, exporters only
7 = economic units with major foreign capital participation, using imported inputs (using imported inputs above 2/3 of the value of their exported production) and exporting output
8 = economic units with major foreign capital participation, using imported inputs (using imported inputs less than 2/3 of the value of their exported production) and exporting output

Global Manufacturing Output

B. Procedure 1 (first criterion)

13. The first step was to identify the economic units that require foreign inputs (their import content accounts for a minimum of 2/3 of the value of their exports) and whose output is destined for exports. This set of economic units is shown in Figure 1 with the letter D.

14. Each tariff code for imports and exports is linked to the corresponding NAICS classes for goods using the correlation table TIGIE-2007 NAICS. The foreign trade data was also linked to the 2009 economic census (EC) and the industrial surveys using the NAICS classification of economic units. This procedure allowed the development of a matrix of global manufacturing output by origin and destination.

15. Using information on the output and the intermediate consumption (IC) by origin, INEGI developed production accounts for global manufacturing activities, which are technically and economically consistent with the foreign trade balance of global manufacturing. The production accounts presented information on gross value of production, IC of domestic and imported origin and gross value added (GVA). Further, consistency analysis for each component of GVA was carried out: the compensation of employees, the gross operating surplus (GOS) and the jobs by economic activity.

16. For measuring the VACGME it is important to identify and separate the IC of domestic origin by type of good and by economic activity. An analysis of the expenditure variables reported in the responses to supplementary questions on raw materials and the detailed questionnaires of the 2009 EC were used for this procedure.

17. Finally an estimate of both the trade and transport margins and the taxes and subsidies on products (where applicable) was done, in order to arrive at value added at basic prices and to link the supplementary tables on supply-use balance of GMP with the main 2008 SUT.

C. Procedure 2 (criteria 2 and 3)

18. This procedure was used to identify the remaining firms which are part of the GVC. The firms that have major participation of foreign capital were considered for this purpose (identified in Figure 1 with the letter C).

19. The analysis of foreign trade transactions identified the economic units with foreign capital participation that destine their production for exports (segments 6, 7 and 8 of Figure 1). It should be highlighted that for the firms showed in 6 and 8 the share of imported inputs is up to 2/3 of the value of their exported production, while for those in 7 the share is above 2/3.

20. For this subset of firms, assumed to be part of GVC, the export values (equivalent to production at basic prices) were measured. The 2008 IOT, specifically the Technical Coefficients Matrix, was used estimate the value of the required inputs of domestic and imported origin and their components of GVA, taxes and subsidies, trade and transport margins and taxes and subsidies of products. Based on this information the respective production accounts were integrated in the 2008 SUT and linked with the supplementary tables.

21. The integration of the results in the SUT required obtaining the subtotals of the production components (intermediate consumption and value added) for global manufacturing industry.[1]

D. Global Manufacturing indicators

22. In order to measure the impact of the global manufacturing activities on the economy a number of indicators were presented. The methodology is introduced below and the detailed results for the manufacturing brunches are presented in table A4 of the Annex.

- Value Added Content of Global Manufacturing Exports (VACGME) in total production

23. The indicator measures the percentage share of VACGME in the Total Production by economic activity branch for a given period expressed at base year prices. It is measured by the formula:

$$VACGME(\%Mp) = \left[\left(\frac{VACGME}{MP}\right)\right] * 100$$

Where:
VACGME (%Mp): VACGME as percentage of Manufacturing Production
VACGME: Value Added Content of Global Manufacturing for Exports.
MP: Manufacturing Production.

- Value Added Content of Global Manufacturing for Exports (VACGME) as proportion to Global Manufacturing Production (GMP)

24. This indicator measures the share of VACGME in to global manufacturing production by economic activity branch for a given period at a base year price. This indicator is calculated with the formula:

[1] The results are presented in the Addendum "Supplementary Global Manufacturing 2008 Supply-Use Tables".

$$VACGME(\%GMP) = \left[\left(\frac{VACGME}{GMP}\right)\right] * 100$$

Where:
VACGME (%GMP): Value Added Content of Global Manufacturing for Exports as proportion of Global Manufacturing Production (GMP).
VACGME: Value Added Content of Global Manufacturing for Exports.
GMP: Global Manufacturing Production.

- Total Value Added Content of Global Manufacturing Exports (VACGME) of an industry in total Global Manufacturing Export (EGM)

25. This indicator measures the percentage share of the VACGME by economic activity branch in the total VACGME, for a given period, at base year prices. The VACGME composition by branch allows quantifying the importance of each branch as generator of VA within the context of the GM. This indicator is calculated with the formula:

$$VACGME_i(\%VACGME_T) = \left[\left(\frac{VACGME_i}{VACGME_T}\right)\right] * 100$$

Where:

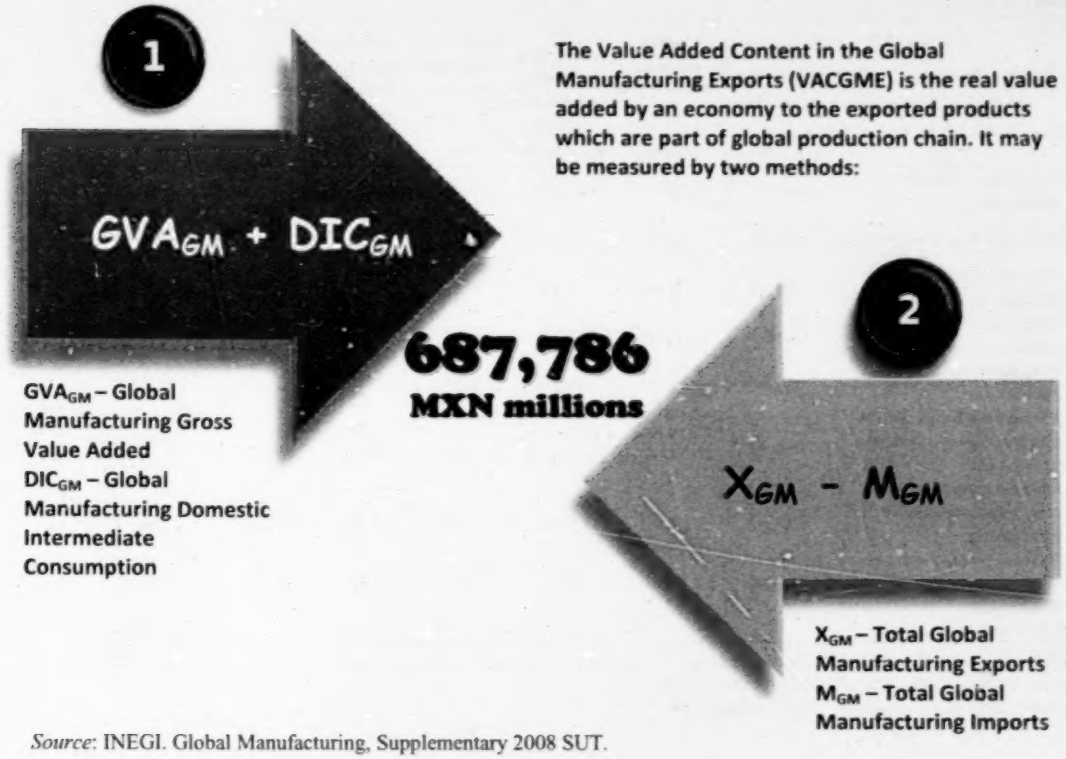
VACGMEi (%VACGMET): Value Added Content of Global Manufacturing for Exports by economic activity branch as share of Total VACGME
VACGMEi: Value Added Content of Global Manufacturing for Exports by NAICS economic activity branch
VACGMET: Total Value Added Content of Global Manufacturing for Exports

IV. Main Results

26. The two methods that can be used to estimate VACGME were introduced in paragraph 8. Figure 2 shows the results from the application of both methods for the year 2008.

27. Table 1 shows the branches of the Mexican economy where global manufacturing is concentrated and the contribution of Mexico to global value chains. The most prominent are Automobile and Trucks Manufacturing (3361), Motor Vehicles Parts Manufacturing (3363) and Electronic Components Manufacturing (3344).

Figure 2
Calculations of VACGME in Mexico, 2008


1
$GVA_{GM} + DIC_{GM}$
GVA_{GM} – Global Manufacturing Gross Value Added
DIC_{GM} – Global Manufacturing Domestic Intermediate Consumption
687,786
MXN millions
2
$X_{GM} - M_{GM}$
X_{GM} – Total Global Manufacturing Exports
M_{GM} – Total Global Manufacturing Imports
The Value Added Content in the Global Manufacturing Exports (VACGME) is the real value added by an economy to the exported products which are part of global production chain. It may be measured by two methods:

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT.

Table 1

Global Manufacturing: main industries according to VACGME, 2008

(millions Mexican pesos)

Branch	Description	*Manufacturing Activities Output at basic prices	Global Manufacturing Output at basic prices	Total Intermediate Consumption at purchaser's prices	Intermediate Consumption Domestic Origing	Intermediate Consumption Imported Origing	Gross Value Added	Value Added Content in the Global Manufacturing for Exports
		P	GMO	IC = ICD + ICM	ICD	ICM	GVA = GMO - IC	VACGME = GVA + ICD
3361	Automobiles and Trucks Manufacturing	423,471	262,548	186,439	96,597	89,842	76,109	172,706
3363	Motor vehicle parts manufacturing	484,080	293,259	244,072	48,737	195,334	49,187	97,925
3344	Electronic components manufacturing	226,498	221,988	202,596	40,256	162,341	19,392	59,647
3341	Computing and peripheral equipment manufacturing	156,588	123,831	112,512	10,637	101,876	11,319	21,956
3343	Audio and video equipment manufacturing	181,809	175,033	160,363	4,740	155,623	14,670	19,410
3391	Non electronic equipment manufacturing and consumables for medical use, dental and laboratory and ocular articles	74,276	63,772	50,143	5,452	44,691	13,629	19,081
3342	Communications equipment manufacturing	144,357	132,891	122,019	5,235	116,784	10,872	16,107
3353	Electric power generation and distribution equipment manufacturing	76,629	41,585	34,064	7,764	26,300	7,522	15,286
	Other Branches							265,668
	Total							687,786

*Includes the value of Global Manufacturing Output (GMO)

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

28. The information shown in table A1 of the annex presents the global manufacturing accounts for the 86 economic activity branches of the manufacturing industry participating in GVC and their contribution to the generation of the GVA in the Mexican economy.

29. Table 2 presents the global manufacturing input –output coefficients for the economic branches with major contribution to the Mexican economy resulting from the application of Method 1.

Table 2
Input-Output Relations of Global Manufacturing

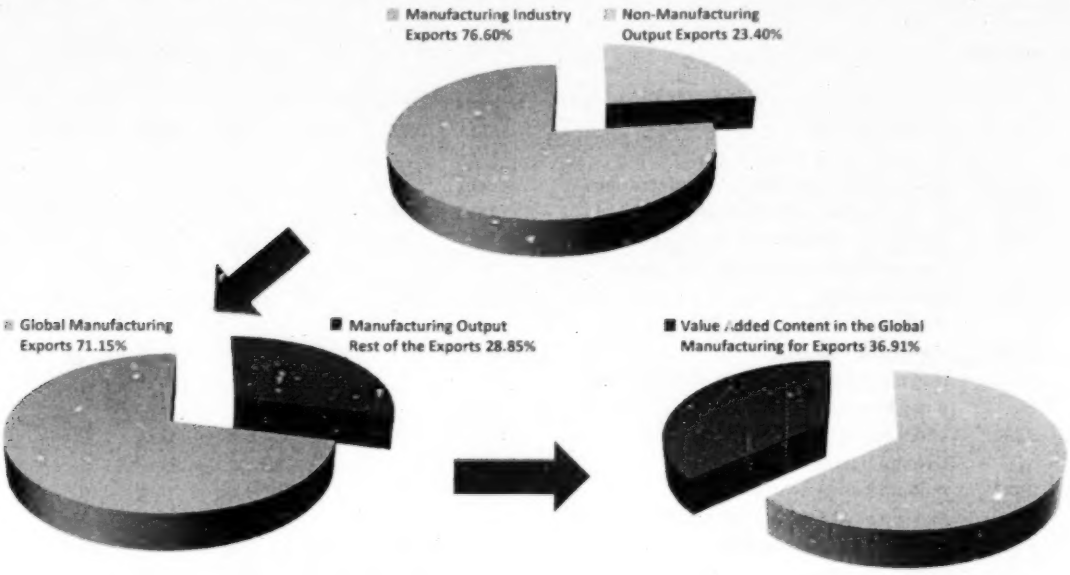
Branches		GMO	IC	ICD	ICM	GVA	VACGME
	Total economy	**1.00**	**0.79**	**0.16**	**0.63**	**0.21**	**0.37**
3361	Automobiles and Trucks Manufacturing	1.00	0.71	0.37	0.34	0.29	0.66
3363	Motor vehicle parts manufacturing	1.00	0.83	0.17	0.67	0.17	0.33
3344	Electronic components manufacturing	1.00	0.91	0.18	0.73	0.09	0.27
3341	Computing and peripheral equipment manufacturing	1.00	0.91	0.09	0.82	0.09	0.18
3343	Audio and video equipment manufacturing	1.00	0.92	0.03	0.89	0.08	0.11
3391	Non electronic equipment manufacturing and consumables for medical use, dental and laboratory and ocular articles	1.00	0.79	0.09	0.70	0.21	0.30
3342	Communications equipment manufacturing	1.00	0.92	0.04	0.88	0.08	0.12
3353	Electric power generation and distribution equipment manufacturing	1.00	0.82	0.19	0.63	0.18	0.37
	Other Branches	1.00	0.66	0.14	0.52	0.34	0.48

GMO = Global Manufacturing Output
IC = Intermediate Consumption
ICD = Intermediate Consumption Domestic Origin
ICM = Intermediate Consumption Imported
GVA = Gross Value Added
VACGME = Value Added Components of Global Manufacturing for Exports
Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

30. VACGME is obtained by adding up the Domestic Intermediate Consumption and the Gross Value Added (that is, 0.16+0.21= 0.37 for total economy).

31. The contribution of manufacturing and global manufacturing to the total export are presented in figure 3. 76.6% of the total exports of goods and services pertain to the units in the Manufacturing Industry, which highlights its importance in Mexico. Global manufacturing export represents 71.1% in the total manufacturing exports. The value added of the Mexican economy to the global manufacturing exports is 36.9%.

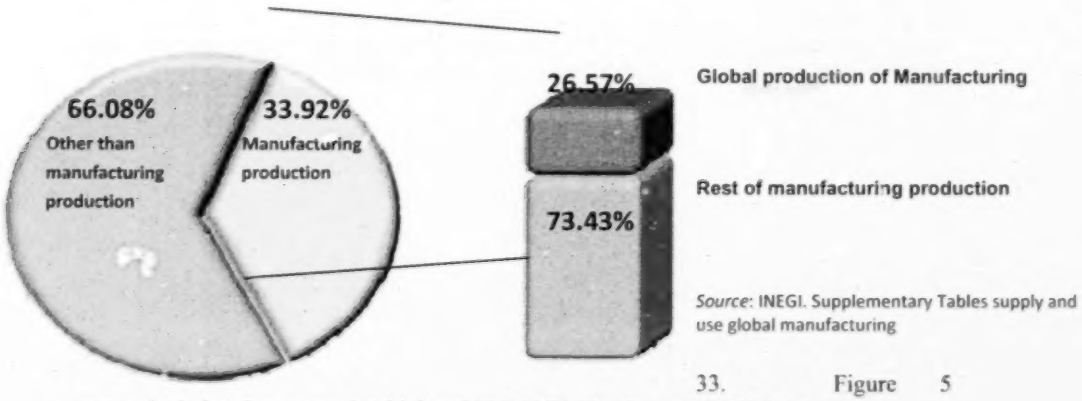
Figure 3
Manufacturing Exports and VACGME, 2008 (Percentage)


Manufacturing Industry Exports 76.60%
Non-Manufacturing Output Exports 23.40%
Global Manufacturing Exports 71.15%
Manufacturing Output Rest of the Exports 28.85%
Value Added Content in the Global Manufacturing for Exports 36.91%

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

32. Figure 4 presents the composition of the economy's total production. 33.9% pertains to manufacturing production, out of which 26.6% are coming from units participating in GVC. This emphasizes the role of Mexican companies (inputs provider, generator of IPP, design, assembling, etc.) in the global manufacturing processes spread in several countries.

Figure 4
Composition of total production in Mexico, 2008 (percentage)

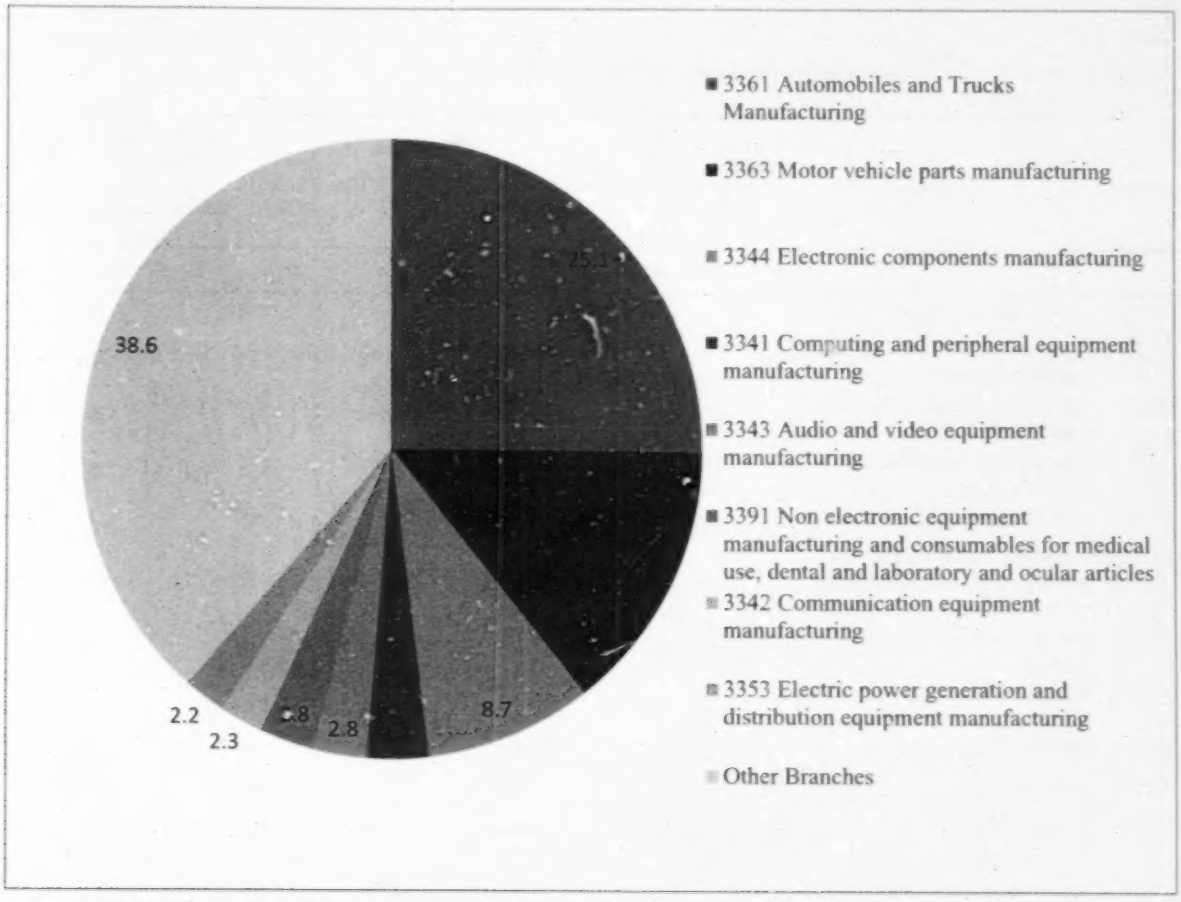


33. Figure 5 presents the industries generating highest VACGME. For the year 2008 these are:

- 3361 Automobile and Trucks Manufacturing 25,1%
- 3363 Motor Vehicles Parts Manufacturing 14.2%

- 3344 Electronic Components Manufacturing 8.7%

Figure 5
VACGME composition, 2008
(percentages)



Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

Annex I

Detailed results

Table A1

Global Manufacturing Production, by economic activity branch, 2008

(millions of pesos)

Branch	*Description*	*Global Manufacturing Production at basic prices*	*Imports CIF*	*Intermediate Consumption domestic origin*	*Gross Value Added*	*Value Added Content of Global Manufacturing of Exports*
		A = B + C + D	**B**	**C**	**D**	**E = C + D**
3111	Production of animal feed	30	9	16	4	20
3112	Grains and seeds mills and oils and fats obtaining	58	29	14	15	28
3113	Production of sugar, chocolate, candies and similar	5 208	3 669	788	751	1 539
3114	Canned fruits, vegetables and prepared foods	1 347	572	420	354	775
3115	Manufacture of dairy products	1	NS	1	NS	1
3116	Slaughter, packaging and processing of meat from cattle, poultry and other food animals	323	275	18	31	48
3117	Preparation and packaging of seafood	672	493	123	56	179
3118	Manufacture of bakery and tortillas	2	1	NS	NS	1
3119	Other food industries	4 076	2 819	547	710	1 257
3121	Beverage Industry	2 544	1 695	622	228	849
3122	Tobacco Industry	3 270	2 556	545	168	713
3131	Preparation and spinning of textile fibers, yarns and manufacturing	2 705	1 215	907	583	1 490
3132	Textile manufacturing	1 812	955	485	371	856
3133	Finishing of textiles and coated fabrics manufacturing	3 023	2 108	467	448	915
3141	Manufacture of carpets, white and similar	2 081	1 351	329	402	730
3149	Manufacture of other textiles, except apparel	3 103	1 587	601	915	1 516
3151	Manufacture of knitted garments	2 978	1 828	337	813	1 150
3152	Manufacture of wearing apparel	32 559	20 924	3 524	8 112	11 635
3159	Manufacture of clothing accessories and other apparel not elsewhere classified	569	477	32	60	92
3161	Tanning and dressing of leather and fur	694	509	95	90	185
3162	Manufacture of footwear	670	421	152	98	250

Branch	*Description*	*Global Manufacturing Production at basic prices*	*Imports CIF*	*Intermediate Consumption domestic origin*	*Gross Value Added*	*Value Added Content of Global Manufacturing of Exports*
		A = B + C + D	**B**	**C**	**D**	**E = C + D**
3169	Manufacture of other products of leather, leather and substitutes materials	2 081	1 313	384	384	768
3211	Sawing and wood preservation	6	3	2	2	4
3212	Manufacture of wood laminated and bonded	33	27	4	2	6
3219	Manufacture of other products of wood	1 137	661	196	280	476
3221	Manufacture of pulp, paper and paperboard	871	257	371	244	615
3222	Manufacture of paper and paperboard	6 843	5 062	733	1 048	1 781
3231	Printing and related industries	3 149	2 126	332	692	1 024
3241	Manufacture of petroleum and coal products	9	1	5	4	9
3251	Manufacture of basic chemical products	9 034	3 602	3 625	1 807	5 432
3252	Manufacture of synthetic resins and rubbers, and fibers	5 538	2 255	2 201	1 082	3 283
3253	Manufacture of fertilizers, pesticides and other agrochemicals	961	595	195	171	366
3254	Pharmaceutical Manufacturing	13 112	11 097	1 104	911	2 015
3255	Manufacture of paints, coatings and adhesives	605	220	218	167	385
3256	Manufacture of soaps, cleaners, and toilet preparations	1 999	759	702	539	1 241
3259	Manufacture of other chemicals	3 393	1 089	1 279	1 025	2 305
3261	Manufacture of plastic products	23 448	16 467	3 342	3 638	6 980
3262	Manufacture of rubber products	8 148	5 178	1 682	1 288	2 970
3271	Manufacture of products based on clays and refractory minerals	6 556	1 814	2 454	2 288	4 742
3272	Manufacture of glass and glass products	3 101	997	1 201	903	2 104
3273	Manufacture of cement and concrete products	501	389	40	72	112
3274	Manufacture of lime, gypsum and plaster products	4	NS	2	2	4
3279	Manufacture of other products made of non-metallic minerals	1 592	569	522	502	1 024
3311	Manufacture of basic iron and steel	10 005	2 351	4 375	3 280	7 655
3312	Manufacture of iron and steel products	5 381	3 573	1 259	549	1 808
3313	Basic aluminum industry	483	135	312	36	348

Branch	*Description*	*Global Manufacturing Production at basic prices*	*Imports CIF*	*Intermediate Consumption domestic origin*	*Gross Value Added*	*Value Added Content of Global Manufacturing of Exports*
		A = B + C + D	**B**	**C**	**D**	**E = C + D**
3314	Industries of nonferrous metals, except aluminum	14 635	10 383	3 052	1 200	4 252
3315	Die casting of metal parts	1 767	782	524	461	985
3321	Manufacture of forged and stamped metal products	1 028	907	61	60	122
3322	Manufacture of non-power hand tools and metal kitchen utensils	2 715	1 516	867	332	1 199
3323	Manufacture of metal structures and products blacksmith	2 387	1 018	778	591	1 369
3324	Manufacturing boilers, tanks and metal containers	4 788	3 183	717	888	1 604
3325	Manufacture of fittings and locks	11 167	6 716	1 997	2 454	4 451
3326	Manufacture of wire, wire products and springs	1 742	355	800	587	1 387
3327	Metalworking and manufacturing screws	301	94	110	97	207
3328	Coatings and metal finishing	1 096	971	60	65	125
3329	Manufacture of other fabricated metal products	24 004	16 693	3 227	4 084	7 311
3331	Manufacture of agricultural machinery and equipment, construction and mining and quarrying	11 165	6 250	2 853	2 062	4 915
3332	Manufacture of machinery and equipment for manufacturing industries, except metalworking	1 545	1 030	152	364	515
3333	Manufacture of machinery and equipment for trade and services	860	497	145	217	362
3334	Manufacture of air conditioning, heating, and cooling for industry and commerce	2 044	1 160	514	370	884
3335	Manufacture of machinery and equipment for the metalworking industry	149	49	42	57	99
3336	Manufacture of internal combustion engines, turbines and transmissions	11 686	5 509	2 953	3 223	6 176
3339	Manufacture of other machinery and equipment for general industry	10 320	6 150	1 792	2 378	4 170
3341	Manufacture of computers and peripheral equipment	123 831	101 876	10 637	11 319	21 956
3342	Manufacture of communication equipment	132 891	116 784	5 235	10 872	16 107

Branch	*Description*	*Global Manufacturing Production at basic prices*	*Imports CIF*	*Intermediate Consumption domestic origin*	*Gross Value Added*	*Value Added Content of Global Manufacturing of Exports*
		A = B + C + D	**B**	**C**	**D**	**E = C + D**
3343	Manufacture of audio and video equipment	175 033	155 623	4 740	14 670	19 410
3344	Electronics Components Manufacturing	221 988	162 341	40 256	19 392	59 647
3345	Manufacture of measuring instruments, control, navigation, and electronic medical equipment	16 954	12 034	1 500	3 421	4 920
3346	Manufacturing and Reproducing Magnetic and Optical Media	9 197	7 930	509	759	1 267
3351	Manufacture of lighting fixtures	9 570	6 395	1 634	1 542	3 176
3352	Manufacture of electrical household appliances	28 722	22 069	3 300	3 353	6 652
3353	Manufacture of generation and distribution of electricity equipment	41 585	26 300	7 764	7 522	15 286
3359	Manufacture of other electrical equipment and fittings	36 116	26 375	4 068	5 672	9 740
3361	Manufacture of cars and trucks	262 548	89 842	96 597	76 109	172 706
3362	Manufacture of bodies and trailers	7 070	4 296	1 527	1 248	2 775
3363	Manufacture of motor vehicles parts	293 259	195 334	48 737	49 187	97 925
3364	Aerospace equipment manufacturing	7 737	5 450	978	1 309	2 287
3365	Manufacture of railway equipment	2 272	1 283	556	432	988
3366	Manufacture of ships	1 138	685	189	264	453
3369	Manufacture of other transport equipment	166	142	13	11	24
3371	Manufacture of furniture, other than office and bookshelf	3 368	1 816	680	873	1 552
3372	Manufacture of office furniture and shelving	1 623	845	520	258	778
3379	Manufacture of mattresses, blinds and curtain rods	3 363	2 130	490	743	1 233
3391	Manufacture of non-electronic equipment and disposables medical, dental and laboratory use, and ophthalmic articles	63 772	44 691	5 452	13 629	19 081
3399	Other manufacturing industries	32 998	24 316	3 648	5 034	8 682
4311	Commerce	74 661	NA	NA	74 661	74 661
4811	Scheduled air transport	293	NA	NA	293	293
4812	Non-scheduled air transport	59	NA	NA	59	59
4821	Railway Transport	1 591	NA	NA	1 591	1 591
4831	Maritime Transport	847	NA	NA	847	847

Branch	*Description*	*Global Manufacturing Production at basic prices*	*Imports CIF*	*Intermediate Consumption domestic origin*	*Gross Value Added*	*Value Added Content of Global Manufacturing of Exports*
		A = B + C + D	**B**	**C**	**D**	**E = C + D**
4832	Inland waterways transport	1	NA	NA	1	1
4841	Motor general freight	29 385	NA	NA	29 385	29 385
4851	Urban public transport and suburban passenger fixed route	NS	NA	NA	NS	NS
4852	Foreign collective passenger transport fixed route	1	NA	NA	1	1
4853	Taxi and Limousine Service	NS	NA	NA	NS	NS
4854	School and personnel transport	NS	NA	NA	NS	NS
4855	Bus rental with driver	NS	NA	NA	NS	NS
4859	Other passenger land transport	1	NA	NA	1	1
4862	Natural gas transmission pipeline	483	NA	NA	483	483
4869	Pipeline of other products	294	NA	NA	294	294
4871	Land Sightseeing Transportation	1	NA	NA	1	1
4872	Tourist Water Transport	NS	NA	NA	NS	NS
4879	Another tourist transport	NS	NA	NA	NS	NS
4881	Services related to air transport	NS	NA	NA	NS	NS
4882	Services related to railway transport	NS	NA	NA	NS	NS
4883	Services related to water transport	228	NA	NA	228	228
4884	Services related to road transport	5	NA	NA	5	5
4885	Intermediary services for freight transport	1 472	NA	NA	1 472	1 472
	TOTAL	**1 863 639**	**1 175 853**	**296 234**	**391 552**	**687 786**

Conclusion

Note:

NS = No significant. Number by rounding misses the minimum unit (<0.5) to register.

NA = Not applicable. No economic significance data.

ND = Unavailable. No existing data.

The sum may not add to totals due to rounding.

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

Table A2

Gross Value Added of Global Manufacturing, 2008

(millions of pesos)

Branch	*Description*	*Gross Value Added*	*Total compensation of employees*	*Net Taxes of Subsidies on Production*	*Gross Operating Surplus*
		A = B + C + D	**B**	**C**	**D**
3111	Production of animal feed	4	NS	NS	4
3112	Grains and seeds mills and oils and fats	15	2	NS	12
3113	Production of sugar, chocolate, candies and similar	751	307	11	432
3114	Canned fruits, vegetables and prepared foods	354	174	5	175
3115	Manufacture of dairy products	NS	NS	NS	NS
3116	Slaughter, packaging and processing of meat from cattle, poultry and other food animals	31	30	NS	1
3117	Preparation and packaging of seafood	56	36	2	18
3118	Manufacture of bakery and tortillas	NS	NS	NS	NS
3119	Other food industries	710	186	6	518
3121	Beverage Industry	228	174	9	44
3122	Tobacco Industry	168	55	6	107
3131	Preparation and spinning of textile fibers, yarns and manufacturing	583	328	8	247
3132	Textile manufacturing	371	142	6	223
3133	Finishing of textiles and coated fabrics manufacturing	448	323	11	114
3141	Manufacture of carpets, white and similar	402	277	5	120
3149	Manufacture of other textiles, except apparel	915	629	8	279
3151	Manufacture of knitted garments	813	724	11	77
3152	Manufacture of wearing apparel	8 112	4 164	127	3 821
3159	Manufacture of clothing accessories and other apparel not elsewhere classified	60	52	1	8
3161	Tanning and dressing of leather and fur	90	37	2	51
3162	Manufacture of footwear	98	85	1	11
3169	Manufacture of other products of leather, leather and substitutes materials	384	231	5	148
3211	Sawing and wood preservation	2	2	NS	1
3212	Manufacture of wood laminated and bonded	2	2	NS	1
3219	Manufacture of other products of wood	280	226	4	50
3221	Manufacture of pulp, paper and paperboard	244	46	3	195
3222	Manufacture of paper and paperboard	1 048	571	14	463
3231	Printing and related industries	692	362	12	319
3241	Manufacture of petroleum and coal products	4	1	NS	3

Branch	*Description*	*Gross Value Added*	*Total compensation of employees*	*Net Taxes of Subsidies on Production*	*Gross Operating Surplus*
		A = B + C + D	**B**	**C**	**D**
3251	Manufacture of basic chemical products	1 807	314	17	1 476
3252	Manufacture of synthetic resins and rubbers, and fibers	1 082	163	6	912
3253	Manufacture of fertilizers, pesticides and other agrochemicals	171	34	2	135
3254	Pharmaceutical Manufacturing	911	217	31	664
3255	Manufacture of paints, coatings and adhesives	167	37	2	128
3256	Manufacture of soaps, cleaners, and toilet preparations	539	126	5	408
3259	Manufacture of other chemicals	1 025	267	11	748
3261	Manufacture of plastic products	3 638	2 260	85	1 294
3262	Manufacture of rubber products	1 288	652	19	617
3271	Manufacture of products based on clays and refractory minerals	2 288	1 218	12	1 058
3272	Manufacture of glass and glass products	903	367	9	527
3273	Manufacture of cement and concrete products	72	38	2	32
3274	Manufacture of lime, gypsum and plaster products	2	NS	NS	1
3279	Manufacture of other products made of non-metallic minerals	502	322	9	172
3311	Manufacture of basic iron and steel	3 280	226	21	3 033
3312	Manufacture of iron and steel products	549	286	14	248
3313	Basic aluminum industry	36	14	1	22
3314	Industries of nonferrous metals, except aluminum	1 200	598	10	593
3315	Die casting of metal parts	461	177	6	279
3321	Manufacture of forged and stamped metal products	60	38	2	21
3322	Manufacture of non-power hand tools and metal kitchen utensils	332	190	5	137
3323	Manufacture of metal structures and products blacksmith	591	383	10	198
3324	Manufacturing boilers, tanks and metal containers	888	614	14	260
3325	Manufacture of fittings and locks	2 454	1 900	16	538
3326	Manufacture of wire, wire products and springs	587	194	6	387
3327	Metalworking and manufacturing screws	97	72	2	23
3328	Coatings and metal finishing	65	47	2	16
3329	Manufacture of other fabricated metal products	4 084	2 337	78	1 669
3331	Manufacture of agricultural machinery and equipment, construction and mining	2 062	1 050	23	989

Branch	*Description*	*Gross Value Added*	*Total compensation of employees*	*Net Taxes of Subsidies on Production*	*Gross Operating Surplus*
		A = B + C + D	**B**	**C**	**D**
	and quarrying				
3332	Manufacture of machinery and equipment for manufacturing industries, except metalworking	364	132	4	227
3333	Manufacture of machinery and equipment for trade and services	217	200	5	13
3334	Manufacture of air conditioning, heating, and cooling for industry and commerce	370	221	7	142
3335	Manufacture of machinery and equipment for the metalworking industry	57	40	1	17
3336	Manufacture of internal combustion engines, turbines and transmissions	3 223	1 096	10	2 117
3339	Manufacture of other machinery and equipment for general industry	2 378	1 301	27	1 050
3341	Manufacture of computers and peripheral equipment	11 319	3 738	67	7 513
3342	Manufacture of communication equipment	10 872	8 835	105	1 932
3343	Manufacture of audio and video equipment	14 670	8 697	138	5 834
3344	Electronics Components Manufacturing	19 392	11 077	223	8 091
3345	Manufacture of measuring instruments, control, navigation, and electronic medical equipment	3 421	2 758	21	641
3346	Manufacturing and Reproducing Magnetic and Optical Media	759	598	15	146
3351	Manufacture of lighting fixtures	1 542	1 294	32	216
3352	Manufacture of electrical household appliances	3 353	1 516	44	1 793
3353	Manufacture of generation and distribution of electricity equipment	7 522	5 175	108	2 238
3359	Manufacture of other electrical equipment and fittings	5 672	3 490	57	2 125
3361	Manufacture of cars and trucks	76 109	7 304	421	68 384
3362	Manufacture of bodies and trailers	1 248	506	20	721
3363	Manufacture of motor vehicles parts	49 187	24 185	536	24 466
3364	Aerospace equipment manufacturing	1 309	1 049	15	245
3365	Manufacture of railway equipment	432	332	4	96
3366	Manufacture of ships	264	219	5	40
3369	Manufacture of other transport equipment	11	1	NS	9
3371	Manufacture of furniture, other than office and bookshelf	873	624	12	237
3372	Manufacture of office furniture and shelving	258	238	6	14

Branch	*Description*	*Gross Value Added*	*Total compensation of employees*	*Net Taxes of Subsidies on Production*	*Gross Operating Surplus*
		A = B + C + D	**B**	**C**	**D**
3379	Manufacture of mattresses, blinds and curtain rods	743	653	10	80
3391	Manufacture of non-electronic equipment and disposables medical, dental and laboratory use and ophthalmic articles	13 629	10 476	140	3 013
3399	Other manufacturing industries	5 034	3 650	57	1 327
4311	Commerce	74 661	NA	NA	74 661
4811	Scheduled air transport	293	NA	NA	293
4812	Non-scheduled air transport	59	NA	NA	59
4821	Railway Transport	1 591	NA	NA	1 591
4831	Maritime Transport	847	NA	NA	847
4832	Inland waterways transport	1	NA	NA	1
4841	Motor general freight	29 385	NA	NA	29 385
4851	Urban public transport and suburban passenger fixed route	NS	NA	NA	NS
4852	Foreign collective passenger transport fixed route	1	NA	NA	1
4853	Taxi and Limousine Service	NS	NA	NA	NS
4854	School and personnel transport	NS	NA	NA	NS
4855	Bus rental with driver	NS	NA	NA	NS
4859	Other passenger land transport	1	NA	NA	1
4862	Natural gas transmission pipeline	483	NA	NA	483
4869	Pipeline of other products	294	NA	NA	294
4871	Land Sightseeing Transportation	1	NA	NA	1
4872	Tourist Water Transport	NS	NA	NA	NS
4879	Another tourist transport	NS	NA	NA	NS
4881	Services related to air transport	NS	NA	NA	NS
4882	Services related to railway transport	NS	NA	NA	NS
4883	Services related to water transport	228	NA	NA	228
4884	Services related to road transport	5	NA	NA	5
4885	Intermediary services for freight transport	1 472	NA	NA	1 472
	TOTAL	282 230	122 713	2 764	156 753
	Trade and transport margins	109 322			266 075
	TOTAL	391 552			266 075

Conclusion

* Includes Trade and Transport Margins

Note:

NS = No significant. Number by rounding misses the minimum unit (<0.5) to register.

NA = Not applicable. No economic significance data.

ND = Unavailable. No existing data.

The sum may not add to totals due to rounding.

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

Table A.3
Jobs in Global Manufacturing, 2008
(Number of jobs)

Branch	*Description*	*Total Jobs*	*Jobs dependent on the firm*	*Paid jobs*	*Owners, family members and other unpaid workers*	*Personnel not dependent on the company*
		A = P + C	**B = D + E**	**D**	**E**	**C**
3111	Production of animal feed	8	4	4	0	4
3112	Grains and seeds mills and oils and fats obtaining	28	19	16	3	9
3113	Production of sugar, chocolate, candies and similar	4 471	3 401	3 401	0	1 070
3114	Canned fruits, vegetables and prepared foods	2 037	1 940	1 939	1	97
3115	Manufacture of dairy products	3	1	1	0	2
3116	Slaughter, packaging and processing of meat from cattle, poultry and other food animals	596	595	595	0	1
3117	Preparation and packaging of seafood	578	578	578	0	0
3118	Manufacture of bakery and tortillas	2	2	2	0	0
3119	Other food industries	1 459	1 206	1 205	1	253
3121	Beverage Industry	1 208	1 030	1 030	0	178
3122	Tobacco Industry	1 176	562	562	0	614
3131	Preparation and spinning of textile fibers, yarns and manufacturing	3 428	2 486	2 474	12	942
3132	Textile manufacturing	1 484	1 291	1 281	10	193
3133	Finishing of textiles and coated fabrics manufacturing	4 840	4 337	4 336	1	503
3141	Manufacture of carpets, white and similar	3 300	2 808	2 808	0	492
3149	Manufacture of other textiles, except apparel	8 554	7 980	7 415	565	574
3151	Manufacture of knitted garments	7 421	7 420	7 420	0	1
3152	Manufacture of wearing apparel	65 426	59 188	59 188	0	6 238
3159	Manufacture of clothing accessories and other apparel not elsewhere classified	537	537	537	0	0
3161	Tanning and dressing of leather and fur	1 278	449	449	0	829
3162	Manufacture of footwear	894	894	894	0	0
3169	Manufacture of other products of leather, leather and substitutes materials	2 907	2 831	2 831	0	76
3211	Sawing and wood preservation	17	17	17	0	0

Branch	*Description*	*Total Jobs*	*Jobs dependent on the firm*	*Paid jobs*	*Owners, family members and other unpaid workers*	*Personnel not dependent on the company*
		A = B + C	**B = D + E**	**D**	**E**	**C**
3212	Manufacture of wood laminated and bonded	21	19	19	0	2
3219	Manufacture of other products of wood	2 088	2 002	1 997	5	86
3221	Manufacture of pulp, paper and paperboard	423	344	342	2	79
3222	Manufacture of paper and paperboard	6 063	4 514	4 500	14	1 549
3231	Printing and related industries	5 313	3 632	3 622	10	1 681
3241	Manufacture of petroleum and coal products	6	4	4	0	2
3251	Manufacture of basic chemical products	2 009	1 609	1 600	9	400
3252	Manufacture of synthetic resins and rubbers, and fibers	1 567	1 296	1 295	1	271
3253	Manufacture of fertilizers, pesticides and other agrochemicals	424	318	318	0	106
3254	Pharmaceutical Manufacturing	2 146	1 328	1 323	5	818
3255	Manufacture of paints, coatings and adhesives	297	201	200	1	96
3256	Manufacture of soaps, cleaners, and toilet preparations	968	928	925	3	40
3259	Manufacture of other chemicals	1 903	1 694	1 665	29	209
3261	Manufacture of plastic products	25 222	21 355	21 330	25	3 867
3262	Manufacture of rubber products	6 263	4 734	4 730	4	1 529
3271	Manufacture of products based on clays and refractory minerals	11 440	9 842	9 829	13	1 598
3272	Manufacture of glass and glass products	3 738	3 076	3 071	5	662
3273	Manufacture of cement and concrete products	269	264	258	6	5
3274	Manufacture of lime, gypsum and plaster products	9	7	4	3	2
3279	Manufacture of other products made of non-metallic minerals	3 647	3 523	3 456	67	124
3311	Manufacture of basic iron and steel	1 361	831	831	0	530
3312	Manufacture of iron and steel products	2 447	2 006	2 006	0	441
3313	Basic aluminum industry	1 158	125	125	0	1 033
3314	Industries of nonferrous	5 915	4 388	4 386	2	1 527

Branch	*Description*	*Total Jobs*	*Jobs dependent on the firm*	*Paid jobs*	*Owners, family members and other unpaid workers*	*Personnel not dependent on the company*
		A = B + C	**B = D + E**	**D**	**E**	**C**
	metals, except aluminum					
3315	Die casting of metal parts	1 821	1 465	1 461	4	356
3321	Manufacture of forged and stamped metal products	325	321	321	0	4
3322	Manufacture of non-power hand tools and metal kitchen utensils	4 079	1 688	1 687	1	2 391
3323	Manufacture of metal structures and products blacksmith	3 899	3 678	3 663	15	221
3324	Manufacturing boilers, tanks and metal containers	3 439	3 425	3 425	0	14
3325	Manufacture of fittings and locks	14 716	14 571	14 555	16	145
3326	Manufacture of wire, wire products and springs	1 737	1 675	1 666	9	62
3327	Metalworking and manufacturing screws	785	603	595	8	182
3328	Coatings and metal finishing	457	447	447	0	10
3329	Manufacture of other fabricated metal products	19 322	15 438	15 433	5	3 884
3331	Manufacture of agricultural machinery and equipment, construction and mining and quarrying	10 328	8 341	8 338	3	1 987
3332	Manufacture of machinery and equipment for manufacturing industries, except metalworking	1 273	1 168	1 154	14	105
3333	Manufacture of machinery and equipment for trade and services	1 554	1 548	1 548	0	6
3334	Manufacture of air conditioning, heating, and cooling for industry and commerce	2 732	2 311	2 311	0	421
3335	Manufacture of machinery and equipment for the metalworking industry	324	311	309	2	13
3336	Manufacture of internal combustion engines, turbines and transmissions	9 081	8 767	8 766	1	314
3339	Manufacture of other machinery and equipment for general industry	9 084	8 851	8 839	12	233
3341	Manufacture of computers and peripheral equipment	51 760	30 424	30 424	0	21 336
3342	Manufacture of communication equipment	79 667	71 258	71 256	2	8 409
3343	Manufacture of audio and video equipment	53 144	51 719	51 719	0	1 425
3344	Electronics Components	112 980	96 884	96 839	45	16 096

Branch	*Description*	*Total Jobs*	*Jobs dependent on the firm*	*Paid jobs*	*Owners, family members and other unpaid workers*	*Personnel not dependent on the company*
		A = B + C	**B = D + E**	**D**	**E**	**C**
	Manufacturing					
3345	Manufacture of measuring instruments, control, navigation, and electronic medical equipment	21 559	21 223	21 219	4	336
3346	Manufacturing and Reproducing Magnetic and Optical Media	4 102	3 550	3 550	0	552
3351	Manufacture of lighting fixtures	11 255	10 955	10 953	2	300
3352	Manufacture of electrical household appliances	15 735	13 661	13 661	0	2 074
3353	Manufacture of generation and distribution of electricity equipment	45 202	40 679	40 674	5	4 523
3359	Manufacture of other electrical equipment and fittings	33 766	28 787	28 777	10	4 979
3361	Manufacture of cars and trucks	28 951	25 948	25 943	5	3 003
3362	Manufacture of bodies and trailers	5 297	4 656	4 612	44	641
3363	Manufacture of motor vehicles parts	230 132	200 802	200 739	63	29 330
3364	Aerospace equipment manufacturing	9 439	8 984	8 984	0	455
3365	Manufacture of railway equipment	2 495	1 443	1 443	0	1 052
3366	Manufacture of ships	1 780	1 742	1 742	0	38
3369	Manufacture of other transport equipment	12	11	11	0	1
3371	Manufacture of furniture, other than office and bookshelf	6 991	6 585	6 539	46	406
3372	Manufacture of office furniture and shelving	2 019	1 973	1 973	0	46
3379	Manufacture of mattresses, blinds and curtain rods	7 953	7 927	7 927	0	26
3391	Manufacture of non-electronic equipment and disposables medical, dental and laboratory use, and ophthalmic articles	89 943	87 847	87 810	37	2 096
3399	Other manufacturing industries	40 124	39 019	38 590	429	1 105
4311	Commerce	NA	NA	NA	NA	NA
4811	Scheduled air transport	NA	NA	NA	NA	NA
4812	Non-scheduled air transport	NA	NA	NA	NA	NA
4821	Railway Transport	NA	NA	NA	NA	NA
4831	Maritime Transport	NA	NA	NA	NA	NA

Branch	*Description*	*Total Jobs*	*Jobs dependent on the firm*	*Paid jobs*	*Owners, family members and other unpaid workers*	*Personnel not dependent on the company*
		A = B + C	**B = D + E**	**D**	**E**	**C**
4832	Inland waterways transport	NA	NA	NA	NA	NA
4841	Motor general freight	NA	NA	NA	NA	NA
4851	Urban public transport and suburban passenger fixed route	NA	NA	NA	NA	NA
4852	Foreign collective passenger transport fixed route	NA	NA	NA	NA	NA
4853	Taxi and Limousine Service	NA	NA	NA	NA	NA
4854	School and personnel transport	NA	NA	NA	NA	NA
4855	Bus rental with driver	NA	NA	NA	NA	NA
4859	Other passenger land transport	NA	NA	NA	NA	NA
4862	Natural gas transmission pipeline	NA	NA	NA	NA	NA
4869	Pipeline of other products	NA	NA	NA	NA	NA
4871	Land Sightseeing Transportation	NA	NA	NA	NA	NA
4872	Tourist Water Transport	NA	NA	NA	NA	NA
4879	Another tourist transport	NA	NA	NA	NA	NA
4881	Services related to air transport	NA	NA	NA	NA	NA
4882	Services related to railway transport	NA	NA	NA	NA	NA
4883	Services related to water transport	NA	NA	NA	NA	NA
4884	Services related to road transport	NA	NA	NA	NA	NA
4885	Intermediary services for freight transport	NA	NA	NA	NA	NA
	TOTAL	**1 135 611**	**998 301**	**996 722**	**1 579**	**137 310**

Conclusion

Note:

NS = No significant. Number by rounding misses the minimum unit (<0.5) to register.

NA = Not applicable. No economic significance data.

ND = Unavailable. No existing data.

The sum may not add to totals due to rounding.

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

Table A4

Global Manufacturing Indicators, 2008

(Percentages)

Branch	Description	$VACGME_i / VACGME_T$ (%)	VACGME / GMP (%)	VACGME / Manufacturing Production (%)
3111	Production of animal feed	NS	68.1	NS
3112	Grains and seeds mills and oils and fats obtaining	NS	49.1	NS
3113	Production of sugar, chocolate, candies and similar	NS	29.6	1.9
3114	Canned fruits, vegetables and prepared foods	NS	57.5	1.5
3115	Manufacture of dairy products	NS	95.8	NS
3116	Slaughter, packaging and processing of meat from cattle, poultry and other food animals	NS	15.0	NS
3117	Preparation and packaging of seafood	NS	26.6	1.7
3118	Manufacture of bakery and tortillas	NS	40.1	NS
3119	Other food industries	NS	30.8	1.2
3121	Beverage Industry	NS	33.4	NS
3122	Tobacco Industry	NS	21.8	3.6
3131	Preparation and spinning of textile fibers, yarns and manufacturing	NS	55.1	11.5
3132	Textile manufacturing	NS	47.3	2.5
3133	Finishing of textiles and coated fabrics manufacturing	NS	30.3	12.0
3141	Manufacture of carpets, whit_ and similar	NS	35.1	5.1
3149	Manufacture of other textiles, except apparel	NS	48.8	9.6
3151	Manufacture of knitted garments	NS	38.6	8.5
3152	Manufacture of wearing apparel	1.7	35.7	10.9
3159	Manufacture of clothing accessories and other apparel not elsewhere classified	NS	16.2	3.2
3161	Tanning and dressing of leather and fur	NS	26.6	2.1
3162	Manufacture of footwear	NS	37.2	0.8
3169	Manufacture of other products of leather, leather and substitutes materials	NS	36.9	11.4
3211	Sawing and wood preservation	NS	60.7	NS
3212	Manufacture of wood laminated and bonded	NS	18.6	NS
3219	Manufacture of other products of wood	NS	41.8	2.6
3221	Manufacture of pulp, paper and paperboard	NS	70.5	1.2
3222	Manufacture of paper and paperboard	NS	26.0	2.0
3231	Printing and related industries	NS	32.5	2.3
3241	Manufacture of petroleum and coal products	NS	91.5	NS
3251	Manufacture of basic chemical products	0.8	60.1	1.3
3252	Manufacture of synthetic resins and rubbers, and fibers	0.5	59.3	4.6
3253	Manufacture of fertilizers, pesticides and other agrochemicals	NS	38.1	1.3
3254	Pharmaceutical Manufacturing	NS	15.4	1.1
3255	Manufacture of paints, coatings and adhesives	NS	63.6	1.1
3256	Manufacture of soaps, cleaners, and toilet preparations	NS	62.1	1.5
3259	Manufacture of other chemicals	NS	67.9	7.5

Branch	Description	$VACGME_i$ / $VACGME_T$ (%)	VACGME / GMP (%)	VACGME / Manufacturing Production (%)
3261	Manufacture of plastic products	1.0	29.8	4.2
3262	Manufacture of rubber products	NS	36.4	8.9
3271	Manufacture of products based on clays and refractory minerals	0.7	72.3	7.3
3272	Manufacture of glass and glass products	NS	67.8	4.5
3273	Manufacture of cement and concrete products	NS	22.3	NS
3274	Manufacture of lime, gypsum and plaster products	NS	96.3	NS
3279	Manufacture of other products made of non-metallic minerals	NS	64.3	7.4
3311	Manufacture of basic iron and steel	1.1	76.5	4.6
3312	Manufacture of iron and steel products	NS	33.6	1.4
3313	Basic aluminum industry	NS	72.0	2.5
3314	Industries of nonferrous metals, except aluminum	0.6	29.1	3.5
3315	Die casting of metal parts	NS	55.8	6.7
3321	Manufacture of forged and stamped metal products	NS	11.8	0.8
3322	Manufacture of non-power hand tools and metal kitchen utensils	NS	44.2	9.1
3323	Manufacture of metal structures and products blacksmith	NS	57.4	3.1
3324	Manufacturing boilers, tanks and metal containers	NS	33.5	5.3
3325	Manufacture of fittings and locks	0.6	39.9	31.1
3326	Manufacture of wire, wire products and springs	NS	79.6	7.1
3327	Metalworking and manufacturing screws	NS	68.8	1.5
3328	Coatings and metal finishing	NS	11.4	NS
3329	Manufacture of other fabricated metal products	1.1	30.5	14.1
3331	Manufacture of agricultural machinery and equipment, construction and mining and quarrying	0.7	44.0	14.4
3332	Manufacture of machinery and equipment for manufacturing industries, except metalworking	NS	33.4	5.1
3333	Manufacture of machinery and equipment for trade and services	NS	42.2	12.3
3334	Manufacture of air conditioning, heating, and cooling for industry and commerce	NS	43.2	2.2
3335	Manufacture of machinery and equipment for the metalworking industry	NS	66.7	3.4
3336	Manufacture of internal combustion engines, turbines and transmissions	0.9	52.9	13.9
3339	Manufacture of other machinery and equipment for general industry	0.6	40.4	13.1
3341	Manufacture of computers and peripheral equipment	3.2	17.7	14.0
3342	Manufacture of communication equipment	2.3	12.1	11.2
3343	Manufacture of audio and video equipment	2.8	11.1	10.7
3344	Electronics Components Manufacturing	8.7	26.9	26.3
3345	Manufacture of measuring instruments, control, navigation, and electronic medical equipment	0.7	29.0	16.9
3346	Manufacturing and Reproducing Magnetic and Optical Media	NS	13.8	9.6
3351	Manufacture of lighting fixtures	0.5	33.2	19.9
3352	Manufacture of electrical household appliances	1.0	23.2	9.1

Branch	Description	$VACGME_i$ / $VACGME_T$ (%)	VACGME / GMP (%)	VACGME / Manufacturing Production (%)
3353	Manufacture of generation and distribution of electricity equipment	2.2	36.8	19.9
3359	Manufacture of other electrical equipment and fittings	1.4	27.0	11.7
3361	Manufacture of cars and trucks	25.1	65.8	40.8
3362	Manufacture of bodies and trailers	NS	39.2	14.7
3363	Manufacture of motor vehicles parts	14.2	33.4	20.2
3364	Aerospace equipment manufacturing	NS	29.6	10.9
3365	Manufacture of railway equipment	NS	43.5	6.4
3366	Manufacture of ships	NS	39.8	17.4
3369	Manufacture of other transport equipment	NS	14.3	0.8
3371	Manufacture of furniture, other than office and bookshelf	NS	46.1	3.4
3372	Manufacture of office furniture and shelving	NS	47.9	9.0
3379	Manufacture of mattresses, blinds and curtain rods	NS	36.7	13.3
3391	Manufacture of non-electronic equipment and disposables medical, dental and laboratory use, and ophthalmic articles	2.8	29.9	25.7
3399	Other manufacturing industries	1.3	26.3	11.4
4311	Commerce	10.9	NA	NA
4811	Scheduled air transport	NS	NA	NA
4812	Non-scheduled air transport	NS	NA	NA
4821	Railway Transport	NS	NA	NA
4831	Maritime Transport	NS	NA	NA
4832	Inland waterways transport	NS	NA	NA
4841	Motor general freight	4.3	NA	NA
4851	Urban public transport and suburban passenger fixed route	NS	NA	NA
4852	Foreign collective passenger transport fixed route	NS	NA	NA
4853	Taxi and Limousine Service	NS	NA	NA
4854	School and personnel transport	NS	NA	NA
4855	Bus rental with driver	NS	NA	NA
4859	Other passenger land transport	NS	NA	NA
4862	Natural gas transmission pipeline	NS	NA	NA
4869	Pipeline of other products	NS	NA	NA
4871	Land Sightseeing Transportation	NS	NA	NA
4872	Tourist Water Transport	NS	NA	NA
4879	Another tourist transport	NS	NA	NA
4881	Services related to air transport	NS	NA	NA
4882	Services related to railway transport	NS	NA	NA
4883	Services related to water transport	NS	NA	NA
4884	Services related to road transport	NS	NA	NA
4885	Intermediary services for freight transport	NS	NA	NA
	TOTAL	**100.0**	**36.9**	**9.8**

Conclusion

Note:

NS = No significant. Number by rounding misses the minimum unit (<0.5) to register.

NA = Not applicable. No economic significance data.

ND = Unavailable. No existing data.

Source: INEGI. Global Manufacturing, Supplementary 2008 SUT

Annex II.

Glossary

Economic Activity. The fields of specific action in which economic units are engage for producing goods and services to satisfy the needs of the institutional units.

Exports. The value of sales exchanges or grants of goods and services; from residents to non-residents. These transactions are considered only those goods that were produced or that includes any productive process performed by residents; while in services, should include transport and insurance that residents within the import transactions.

Global manufacturing. Is all economic activities carried out by undertakings whose inputs come mainly from abroad, its production is intended for the most part, or all, export. They are companies that have majority ownership of foreign capital that can be controlled by foreign parent companies and/or be obeying the interests of global value chains.

Global Value Chain. The set of interrelated activities engaged in a production process having place in more than one country where each one adds a fraction of producing goods Value Added.

Goods. Physical objects on which is feasible to establish property rights also could be used for producing other goods and services to satisfy society's needs and available for storage and merchandising several times.

Gross Operating Surplus. A measure of the surplus accrued from the processes of production before deducting any expenses, explicit or implicit, in concept of interests and income or other income of the property payable by financial assets, land and land or other natural resources needed to carry out the production process.

Gross Value Added. Is the value added to goods and services, during the production process. It is the difference between the gross value of production and the value of intermediate consumption.

Imports. Are goods and services introduced a country through the International Commerce.

Imposed on products. These are mandatory payments without consideration, which can be monetary or in kind, and that institutional units make the Government by performing in the market the goods or services produced.

Input-output matrix. A set of pictures that reflect and update the formal relations that carry out various sectors and economic agents involved in all phases of the economic cycle (production, marketing, consumption and accumulation).

Intermediate Consumption. The value goods and services used as inputs in the productive processes. Excluding fixed assets because their consumption is recorded in the Value Added as capital consumption. Emphasizing that these goods could be fully transformed or consumed in the processing or reappear in the production sphere as inputs to conclude that stage.

Main Activity. Those that their Value Added exceeds that of any other within the same unit (the production of the main activity has to be in goods and services supplied to other units, despite that could be used for self-consumption or for own capital formation.

Manufacturing Industry. Is the set of economic units that combines resources under a single owner or controlled by self or others (maquila) activities of assembling, processing

either total or partial transformation of raw materials resulting in the production of new goods and services in a single location, bounded by buildings and facilities.

Production Accounts. Accounting arrangements showing the way how income is generated, distributed and used in the economy. Integrating Production, Intermediate Consumption and Value Added.

Production value. The value of the goods he transformed, processed or benefited by the economic unit during a time period. Is the value of the processed products and the value of the production of fixed assets for own use.

Products subsidies. Is the sum of money that the Government delivers to the producer, to reduce the price paid by the consumers thereof. A subsidy on a product is required, normally, when occurs, sells or imports the goods or service, but also be paid in other circumstances, for example, when good is transferred, leased, supplied or used for personal consumption or own capital formation.

The North American Industrial Classification System (NAICS). Economic activities classificatory for the region of North-American. NAICS contains agreed categories of trilaterally by United States (USA).UU.), Canada and Mexico, and other national detail. It is composed of five levels of aggregation: sector, sub-sector, branch, sub-branch and kind of activity, identified with two, three, four, five and six digits, respectively. The sector is the most general level; the class, the more disaggregated. NAICS 2007 contains 20 sectors, subsectors 94, 304 branches, 617 sub-branches and 1,049 kinds of economic activity. Activities economic classified in it is grouped in a traditional way in three large groups: primary, secondary and tertiary activities.

Value Added Content of Global Manufacturing Exports. The real value added by an economy to exported goods which are a part of a global manufacturing process satisfying the requirements of the GVC. At total economy level could be measured with two methods.

United Nations ECE/CES/GE.20/2014/12

Economic and Social Council

Distr.: General
25 February 2014

Original: English

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on National Accounts

Thirteenth session
Geneva, 6-9 May 2014
Agenda item 7
Globalization and national accounts: accounting for global production

Typology of Global Production Arrangements [Chapter 2]

Prepared by Task Force on Global Production

Summary

The document is an extract from the draft "Guide to measuring global production", providing a typology of global production arrangements. This typology can be helpful in identifying how much explicit coordination takes place, which can be an indication of how much control (and the associated risk) a lead enterprise has over the production process. This information is required for national accountants and balance of payments compilers to understand the nature of transactions taking place inside global value chains.

The Guide was developed by a Task Force to assist national accounts and balance of payments compilers with recording global production related activities in their accounts. The Task Force is chaired by Ireland and the guide has been edited by the Netherlands.

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I. Introduction

1. This chapter provides a typology of global production arrangements. A typology can be helpful in identifying how much explicit coordination takes place, which can be an indication of how much control (and the associated risk) a lead enterprise has over the production process. This information is required for national accountants and balance of payments compilers to understand the nature of transactions taking place inside global value chains. For each product or asset flow observed inside global value chains, it must be decided whether a transfer of economic ownership takes place. The principles of economic ownership are further explored in Chapters 3 and 4 of the Guide to Measuring Global Production. This chapter discusses the various kinds of economic relationships that may exist between a principal, or leading enterprise, and other units, such as producers on a fee or contract basis (referred to as contractors), participating in the global value chain.

2. The typology presented in this chapter aims to strengthen international comparability by providing guidance to national compilers on the proper breakdown of the activities along the global production chain. However, the analysis of real case examples may be blurred by various arrangements that may be brought together into one global value chain. At the same time, multinational enterprises may rearrange their global production from one day to another. The various country case studies in this Guide to measuring global production illustrate these real life complexities.

3. The following section focuses first on one specific type of global production arrangement, namely those managed by so-called factoryless goods producers (FGPs). The nature of FGPs in terms of their economic activity classification as well as their role in the global value chain requires further examination before introducing the complete typology as presented and illustrated by several numerical examples in Section III. The last section of this chapter winds up with conclusions and recommendations.

II. The classification of factoryless goods producers

4. The recommendations in this section were supported by the Advisory Expert Group on National Accounts (AEG) but the consultation with the UN Expert Group on International Statistical Classifications has not been finalized. Therefore, the proposals in this section are not fully concluded.

5. A traditional manufacturer may use a contractor to provide specialization in a certain type of processing activity to allow the manufacturer to focus on "core" manufacturing activities. Under traditional manufacturing arrangements the ownership of material inputs is a relevant factor in determining whether goods were being produced on own-account or under contract. However, there are a growing number of cases, especially in the production of many high tech products, where the traditional manufacturing arrangement does not hold. A firm may become purely factoryless.

6. The factoryless goods producer (FGP) concentrates on innovation and marketing decisions. While the FGP does not supply material inputs into the production process, the FGP does supply substantial service inputs in the form of technology, know-how, and product design. In addition, the FGP may be monitoring the quality of material inputs through selection or preapproval of certain material input providers. Likewise, the FGP maintains control over the outcome of the production process by providing technical specifications that are essential for the transformation of the material inputs. The FGP controls access and delivery of the final output to consumers.

7. The contractor manages the transformation process by supplying material inputs (according to the specifications of the principal) and transforming them to final products according to the blueprints provided by the FGP. The contractor delivers pre-specified goods to the FGP at pre-determined prices and cannot sell the goods to parties other than the FGP.

8. The transaction that takes place between the contract processor and the FGP cannot be considered a traditional market transaction. A key element in the arrangement between the principal and the contractor is the conditionality of the transaction, which makes the contractor captive. Control over the outcome of the production process and ownership and provision of the intellectual property product (IPP) inputs coincide with the economic ownership of the final output.

9. Case C in the next section and summarized in Table 1 presents the main features of the FGP arrangement. When the FGP does not obtain direct ownership of the material inputs prior to transformation, the industrial classification of the FGP is not straightforward. Paragraphs 140 – 145 of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC, Rev.4) clarify the criteria for classifying a principal that outsources a production process as follows:

> *Outsourcing of parts of the production process*
>
> 140. If only part of the production process is outsourced, the principal is classified to the class that corresponds to the activity representing the complete production process, i.e., it is classified as if it were carrying out the complete process, including the contracted work, itself.
>
> 141. This applies not only to the outsourcing of support functions in the production process, such as accounting or computing activities, but also to the outsourcing of parts of the core production process, such as parts of a manufacturing process.
>
> *Outsourcing of the complete production process*
>
> 142. In general, if the principal outsources the complete production process of a good or service, it is classified as if it were carrying out the production process itself. This applies in particular to all service-producing activities, including construction. In the case of manufacturing, however, the following special considerations apply.
>
> 143. In manufacturing, the principal provides the contractor with the technical specifications of the manufacturing activity to be carried out on the input materials. The input materials (raw materials or intermediate goods) can either be provided (owned) by the principal or not.
>
> 144. A principal who completely outsources the transformation process should be classified into manufacturing if and only if it owns the input materials to the production process—and therefore owns the final output.
>
> 145. A principal who completely outsources the transformation process but does not own the input materials is in fact buying the completed good from the contractor with the intention to re-sell it. Such an activity is classified in section G (wholesale and retail trade), specifically according to the type of sale and the specific type of good sold.

10. A strict interpretation of paragraphs 142 – 145 of ISIC Rev. 4 would mean that a FGP should be classified as a distributor if the FGP does not provide (own) the material inputs subject to processing, even though the FGP provides the technical specifications of the output and owns and supplies other critical inputs. In case the contractor and customers

are situated abroad, the transactions of the FGP would, according to these classification rules, be recorded in accordance with a merchanting arrangement (Case B in Table 1).

11. In many cases, the value of the output of FGPs reflects the contribution of IPP inputs which could be as much or more than that of material inputs. The strict interpretation of ISIC (that the final output of a FGP is simply a distribution activity) does not take into account all the services used in the production process, particularly IPP inputs developed and supplied by the principal. For a contractual relationship where the principal controls the outcome of the processing performed by the contractor (whether de facto or de jure), the latter has an obligation to acquire the output that meets the requirements of the contractual arrangement, and the principal has implicitly accepted the risks and rewards of the contracted work in terms of its outcome. In addition, there are broader issues related to the control of the production process in a contractual relationship between a principal and a contractor that merit further consideration. The FGP does more than simply buying and selling. In particular, the value added by a FGP may be significantly more than the margin associated with the activities of merely distributing a good from a producer to a consumer because the IPP inputs embedded in the good may contribute significant value to the good. In addition, FGPs control the outcome of the production process, and therefore, the nature of their activities differs significantly from distributive activities.

12. Given the increasing prevalence of firms fragmenting their production processes, additional criteria need to be considered when classifying FGPs. Under a factoryless arrangement, the principal generally controls the blueprints of production, access to customers, trademarks, and other sources of significant value embodied in the final output. The contractor generally only manages the processing activities by strictly following the specifications provided by the principal. A key characteristic of the contractual arrangement is the captive nature of the contractor. Processing activities cannot be undertaken without the blueprints provided by the principal. Once processing is finalized according to the conditions of the contract, the contractor is entitled to compensation from the principal, and the output is no longer under the contractor's control. The contractor is not allowed to sell the output to other parties but must sell to the principal.

13. In circumstances where a principal specifies the conditions required to make a particular product and guarantees acquisition of the product from the contractor when the conditions are met, the principal has assumed the economic risks (e.g., product price changes, improved IPP inputs available to competitors, commercial success of the product, etc.) associated with production to a degree sufficient for the principal to be classified as a manufacturer. In this case, a key element in the conditions of the contract between the principal and the contractor is the conditionality of the transaction, which makes the contractor captive. Based on the conditions of the contract, the value added contributed by the contractor does not reflect the full value of the final output because the contractor does not assume the economic risks associated with owning the IPP inputs and controlling the outcome of the production process.

14. While ownership and provision of material inputs is an important consideration, the following additional two criteria are recommended to determine economic ownership of the final output and classification of a FGP:

(a) Control over the outcome of a production process;

(b) Ownership and provision of IPP inputs.

15. Differentiating between various contracts for the purposes of compiling national accounts and international accounts pose practical problems, but a separate subset of existing classifications for FGPs and their transactions would improve the accounts. Central to the subset of existing classifications is the fact that FGPs differ in many respects from (a)

manufacturers that play a more active role in physical transformation and (b) from pure distributors that play a more passive role in production.

III. Typology of global production arrangements

16. After having reviewed the main characteristics of FGPs, the next step is providing a complete typology, including FGPs and other types of arrangements.

17. Global value chains may be set up and managed in various ways. Sometimes the chain follows the organisational structure of a multinational enterprise (MNE). Alternatively the chain may be represented by a number of unaffiliated companies. A principal is usually the organising and controlling company of such arrangements. The unaffiliated contractors may become quite dependent on its relationship with the principal. Under such circumstances the difference between an affiliated and an unaffiliated contractor can be very unclear. The control exerted by a principal on a captive unaffiliated contractor can be practically the same as the control exerted by the MNE parent in a direct investment relationship on its affiliate. One difference is perhaps that unaffiliated contractors may supply their output to more than one principal.

18. Two key features of a dependant relationship are (a) the principal controls the specifications of the output of the contractor and (b) usually plays a leading role in IPP management. Global production arrangements constitute much more than simply a sequence of interlinked markets. As illustrated in figure 1.2, production chains are importantly characterized by the information streams required to connect principals, the lead firms coordinating the tasks, and suppliers. This knowledge aspect of global production chains clearly has a linkage to management of the supply chain and exchange of intellectual property. The principles of ownership and management of intellectual property is further discussed in Chapter 4 of the Guide.

19. This section will focus on several types of global production arrangements where a lead enterprise arranges their particular network of suppliers to produce a given good or service. The typology discusses the different types of global value chains and translates these into the current interpretation of the international standards. In reading this section it will become clear that further consideration may be necessary on some aspects of the various global production arrangements and later chapters of the Guide will address these issues.

20. The main objectives of developing this typology are the following. Firstly, it supports the proper breakdown of economic activities along the global production process on a country-by-country basis. Secondly, it helps in assigning the kind of economic activity of a principal, an enterprise that exerts a certain level of control over the production process, and supplier, contractors, goods producers, and other participating units in the global production process. Thirdly, the typology assists in identifying the economic ownership of inputs, outputs, and intellectual property for the activities along the production process. Fourthly, the typology helps identify the type of output (goods, trade margins, services) of the participating units in the global production arrangement.

21. To better understand the various types of global production arrangements it is useful to look at the entire production process from the viewpoint of the domestic entity involved in the global value chain. For national accounting purposes, it is important to identify the economic activity of each of the participating units in the production chain as well as the value added of each unit. The typology presented in this section uses ISIC, Rev.4 as the industry classification system that groups producing units into detailed industries based on similarities in the economic activity, taking into account the characteristics of the outputs, the inputs and the process and technology of production.

22. To better understand the nature of a production activity and the output it generates, e.g. a good or service, it is also important to identify each entity's involvement in terms of ownership of the material inputs, intellectual property and outputs at each stage of the production process.

23. Table 1 describes global production arrangements for producing goods and services from the viewpoint of the domestic entity and reflects the various combinations of economic ownership of the inputs and outputs in the production process. To address the various boundary issues of global production arrangements, all combinations of economic ownership are discussed. The table also addresses cases where no lead enterprise can be identified.

24. The table indicates the economic engagement between the principal and the supplier in terms of production and does not necessarily designate direct investment relationships. In other words, the supplier may, or may not, be owned by the principal. The table assumes that economic ownership of the materials, the intellectual property, and output can be assigned to either the principal or the supplier. In practice this may be a difficult task. Chapters 3 and 4 of the Guide address the principles of economic ownership of materials and intellectual property, respectively.

25. The identification of the economic ownership of inputs, outputs and intellectual property is not only important for determining the type of economic activity in terms of industry classification of entities engaged in global production but also for the type of output the unit produces (e.g., a trade margin or a manufactured product) and how the international trade flows related to global production should be recorded.

Table 1

Typology of global production arrangements and transactions involved

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
A. "Goods sent for processing abroad"	Domestic (Principal)	Manu-facturing	Manu-facturing	X	X	X	Goods	Record the processing fee as an import of a manufacturing service. Record materials sent for processing as imports of goods if purchased abroad. Exclude materials sent for processing from exports of goods if purchased in the domestic economy. Record the output of manufactured goods as exports of goods if sold abroad. Exclude the output of manufactured goods from imports of goods if sold in the domestic economy.
	Foreign Supplier	Manu-facturing service provider	Manu-facturing				Services	Record processing as exports of manufacturing services.
B. Goods under merchanting	Domestic	Merchanting	Trade			X	Services (Margin on	Record the purchase of a good under merchanting as a negative export, and the

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
							Goods)	subsequent sale as a positive export, of goods. The difference represents the trade margin as output of the merchant. If the physical form of the goods is changed during the period the goods are owned, as a result of manufacturing services performed by other entities, then the goods transactions are recorded under general merchandise rather than merchanting.
	Foreign Supplier	Manu-facturing	Manu-facturing	X	X		Goods	Record the output of the supplier as an export of goods.
C. Factoryless goods production (*recommended treatment*)	Domestic Principal	Factoryless goods production	Manu-facturing, subset factoryless goods producers		X	X	[Goods]	[If output is sold abroad, record the purchase as an import, and the subsequent sale as an export of goods If output is sold in the domestic economy record the purchase as an import of goods.*]
	Foreign Supplier	Manu-facturing	Manu-facturing	x			[Goods]	[Record the output as exports of goods.]
D. Fragmenting part of production of services, IPPs	Domestic (Principal)	Production of services	Appropriate service Industry		X	X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
E. Fragmenting part of production of services, excluding IPPs	Domestic (Principal)	Production of services	Appropriate service Industry			X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
F. Subcontracting production of services	Domestic (Principal)	Purchase and sale of service without any significant transformation of the service between purchase and sale	Appropriate service Industry			X	Services	Imports of services (by type). If the principal sells the service abroad, record gross value in exports of services (by type).
	Foreign Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type).
G. Direct Investment	Domestic	Financial and business	Section M				Services	None

Production process from point of view of domestic entity	*Entities involved*	*Economic activity*	*ISIC Industry*	*Economic ownership of*			*Type of output*	*International transactions related to production process*
				Materials	*Intellectual Property*	*Output*		
Enterprise not directly engaged in producing goods		services						
	Foreign Supplier	Manu-facturing	Manu-facturing	X	X	X	Goods	Exports of general merch ndise.
H. Direct Investment Enterprise not directly engaged in producing services	Domestic	Financial and business services	Section M				Services	None
	Foreign Supplier	Production of services	Appropriate service Industry	X	X	X	Services	Exports of services.

* The classification of the transaction between the contractor and the FGP (as a good or a service) will be further examined by the Task Force

26. The following subsections provide simple examples of the global production arrangements presented in Table 1. All cases describe global production arrangements where the principal is located in one country and the supplier in another country. All cases are illustrated with the help of an 'athletics shoe manufacturing' example.

A. Case A: Transformation of materials owned by a domestic principal

27. Under this global production arrangement the domestic principal owns the materials and purchases manufacturing services from a foreign supplier to transform the physical inputs into another product. Over the course of the transformation process, the principal maintains economic ownership of the processed raw materials or semi-manufactured goods as well as the goods after processing. This arrangement is also referred to as 'goods sent abroad for processing' (2008 SNA) or 'manufacturing services on physical inputs owned by others' (BPM6).

28. Between the 1993 and 2008 version of the SNA (and BPM5 and BPM6) there has been a fundamental change in the treatment of goods for processing without a change of ownership. According to the former standards (1993 SNA, BPM5), transactions were recommended to be recorded on a cross-border basis, which resembled an imputed change of ownership. Materials were shown as exports of goods when sent abroad by the principal, and then recorded as imports of goods on their return to the principal's territory. The difference between the initial export and subsequent import reflected an implied processing fee. The new guidelines (2008 SNA, BPM6) recommend transactions to be recorded based on a change in economic ownership. As long as the principal retains economic ownership, materials shipped to the processor are no longer recorded as exports of goods by the principal, and goods subsequently returned to the principal's territory are no longer recorded as imports of goods. Likewise, materials purchased by the principal and shipped directly to the processor without entering the principal's territory are recorded as imports by the principal, and the resulting processed good is recorded as an export if it is sold anywhere except the principal's territory. In any case, the processing fee is recorded by the principal as an import of a service and by the processor as an export of a service. Chapter 5 of the UNECE Globalization Guide provides further details.

29. Consider a principal engaged in making athletic shoes. The production of the shoe can be divided into three main parts: (1) the top of the shoe, called the upper; (2) the midsole, the most important part of this athletic shoe because it is the part that cushions and

protects the foot; and (3) the outsole. Suppose the principal created a new innovative design that cushions the foot and provides for better athletic performance. The principal produces the newly designed midsole at its domestic manufacturing plant. However, the principal decides that it is more cost effective to send the midsole and the other materials (the upper and the outsole) it has manufactured to another country for final assembly. There is no change in ownership of the various parts of the shoe sent abroad for further processing. The principal simply pays a processing fee to the supplier to assemble the shoe. The shoe is marketed and sold by the principal, so it owns the output and receives the revenue. The principal may or may not take physical possession of the final output. The output could be shipped directly from the processor to the final buyer in the principal's country; the output could remain in the processor's country; or the output could be shipped directly to another country.

30. The key points of this arrangement are that the supplier only receives a processing fee which is not the full value of the final good but represents the reward for assembling the shoe. The principal is the economic owner of the materials, the intellectual property (the innovative design of the midsole), and the output.

31. Following ISIC Rev.4 both the principal and supplier are classified in the manufacturing industry. The principal reports the revenue it received from selling the shoes at full value as its output. The processor reports only the revenue it received from the contract work (not an imputed value for the shoe) as output of manufacturing services in the production account of the processor.

32. The following numerical examples illustrate this global production arrangement. Let us first discuss the case where the production process required to make the good is entirely carried out by the principal enterprise in country A and is exported to country C. From this starting point, the examples will change slightly using the data supplied in Table 2. This table illustrates the breakdown of the value of the athletic shoe.

Table 2
Breakdown of value of the athletic shoe

Value components	
Material inputs	30
Compensation of production workers	20
Compensation of managers for managing production	2
Other purchased services associated with production of the shoe	3
Return on intellectual property products (IPP)	30
Compensation of sales workers	15
Purchased services associated with selling the shoe	4
Profit on selling the shoe	6
Total	110

1. Athletic shoes example A1

33. The principal maintains two types of establishments in country A, a manufacturing establishment responsible for producing shoes and a wholesale establishment responsible for marketing and selling the shoes. The manufacturing establishment purchases material inputs, such as leather, valued at 30 and transforms the material inputs into the athletic shoes valued at 85. The wholesale establishment sells the shoes to a customer located in

Country C for 110. Table 3 illustrates the production accounts of the manufacturing and wholesale establishments in country A and a further break down of the components of value added of the principal that represents the return to labour in the form of compensation of employees and the return to capital. This latter component includes the capital services (cf. Chapter 20, 2008 SNA) from the intellectual property embedded in the product and the trade margin for selling the good.

Table 3
Example A1 – Production account, country A

	Manufacturing	*Trade*	*Total*
Output	**85**	**25**	**110**
Goods	85	0	85
Services	0	25	25
Intermediate consumption	**33**	**4**	**37**
Materials	30	0	30
Processing services	0	0	0
Other services	3	4	7
Value added	**52**	**21**	**73**
Compensation of employees	22	15	37
Taxes less subsidies on production and imports	0	0	0
Gross operating surplus	30	6	36

The trade balance between countries A and C as presented in Table 4 resembles a very simple picture. The export of shoes from country A to country C equals 110.

Table 4
Example A1 – International transactions

	Country A	*Country C*	*Total*
Export	**110**	**0**	**110**
Goods	110	0	110
Imports	**0**	**110**	**110**
Goods	0	110	110

2. Athletic shoes example A2

34. There are varying degrees of transformation a principal may outsource to contractors. The principal may perform some of the transformation required to make the good or may not perform any of the transformation at all. In the latter case, the principal purchases all the required material inputs to make the good and send those materials to the supplier for final assembly. The following example illustrates the case where the principal purchases all the required material inputs but does not perform any transformation.

35. The principal decides to contract with a supplier in country B to assemble the athletic shoes. The principal in country A purchases the material inputs from a materials supplier in country A and sends those materials to country B for processing. In addition, the principal retains the rights to the intellectual property and instructs the supplier how to

assemble the shoe. The supplier supplies all the production workers required to make the shoe.

36. The principal maintains two types of establishments in country A. The first establishment is responsible for managing the production of the shoes through the use of contractors who transform the materials still owned by the principal. This establishment is according to ISIC Rev.4 classified within manufacturing. The second establishment is a wholesaler responsible for marketing and selling the shoes. The manufacturing establishment pays the supplier in country B a processing fee for assembling the shoe of 20. The wholesale establishment sells the shoes to a customer located in Country C for 110.

37. Table 5 illustrates the production accounts of all related activities in countries A and B. The same hypothetical value components as shown in Table 2 are applicable for illustrating example A2. To keep the example simple, the value added of the supplier is only the compensation of the production workers the supplier hires to assemble the shoe. In addition, there is no assumed efficiency gained from using the contractor to produce the shoe.

Table 5
Example A2 – Production account, countries A and B

	Principal Country A			***Supplier Country B***
	Manufacturing	*Trade*	*Total*	*Manufacturing*
Output	**85**	**25**	**110**	**20**
Goods	85	0	85	0
Services	0	25	25	20
Intermediate consumption	**53**	**4**	**57**	**0**
Materials	30	0	30	0
Processing services	20	0	20	0
Other services	3	4	7	0
Value added	**32**	**21**	**53**	**20**
Compensation of employees	2	15	17	20
Taxes less subsidies on production and imports	0	0	0	0
Gross operating surplus	30	6	36	0

38. Table 6 illustrates the international transactions on a balance of payments basis. Because the merchandise trade statistics are compiled based on customs documents that reflect the physical movement of goods across borders, the merchandise trade data must be adjusted to accord with BPM6 and 2008 SNA concepts. In this example, the materials, such as leather, required to make the athletic shoe are sent from country A to country B without a change in ownership. Therefore, negative adjustments are needed to remove the materials sent from country A to country B because there is no change of ownership. Similarly, the shoes that are sent directly from the processor in country B to the customer located in country C should not be recorded as exports from country B.

39. In addition, since the principal in country A sells the shoes to a customer located in country C without the shoe entering the customs territory of country A positive adjustments

are needed to add the goods sold abroad after processing as exports of country A, to align the transaction to a balance of payments basis.[1]

Table 6
Example A2 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**110**	**20**	**0**	**130**
Goods	110	0	0	110
Manufacturing services on physical inputs owned by others	0	20	0	20
Imports	**20**	**0**	**110**	**130**
Goods	0	0	110	110
Manufacturing services on physical inputs owned by others	20	0	0	20

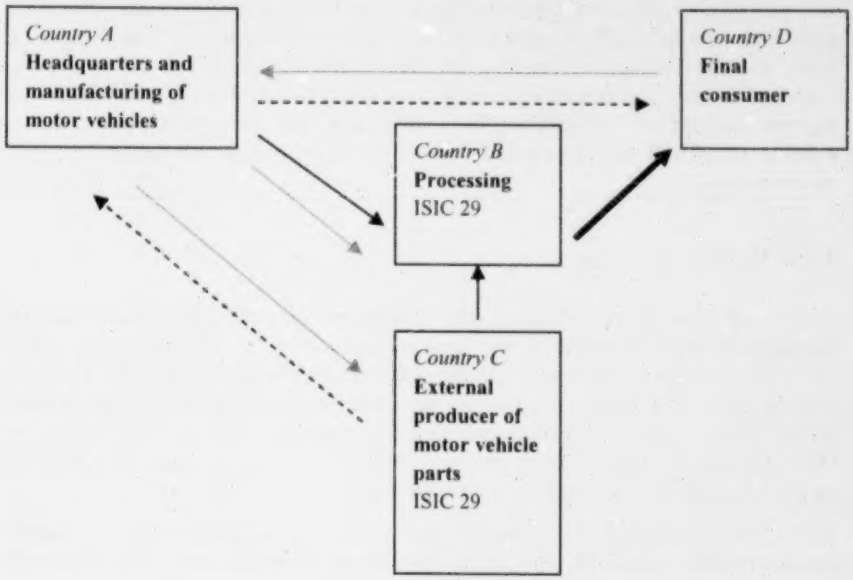
40. Example A2 illustrates the case where the principal purchases all the required material inputs and the supplier does not purchase any of the materials. In some processing arrangements, the supplier may purchase some of the material inputs. It is quite likely that certain intermediate goods will not be delivered by the principal. For example, in the shoe case, glue may be needed to connect the outsole, midsole and the upper. It may happen that this glue is purchased directly by the supplier. Similarly, it is likely that the supplier is charged for housing and energy costs.

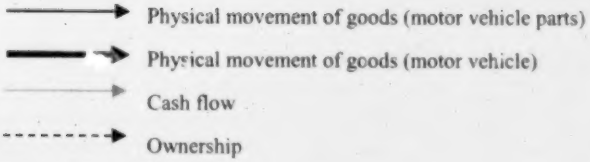
41. BPM6 (par.10.64) states that a manufacturing service fee could include the cost of materials purchased by the processor. No cut-offs are mentioned indicating the amount of material inputs that can be purchased by the supplier and still be included as a case of "manufacturing services on physical inputs owned by others". The same paragraph (10.64) also states that manufacturing services on physical inputs owned by others refer to *all* work done on goods by a resident of one economy for the owner of goods who is resident in another economy. This seems to imply that even substantial amounts of intermediate consumption by the contractor do not change the nature of the arrangement. A key principle in the 2008 SNA and BPM6 is that goods sent abroad for processing will not be recorded as the export of a good, as no transfer of ownership takes place.

[1] For information on reconciliation between merchandise source data and total goods on a balance of payments basis see BPM6 Table 10.

Country case study 2.1

Goods for processing sent to third countries





An MNE in the motor vehicle industry has its headquarters located in country A and foreign affiliates in various different countries. The enterprise manufactures motor vehicle parts, mostly in country A, where the company is classified under ISIC 29: Manufacture of motor vehicles, trailers and semi-trailers. These parts are shipped to country B where the finished product is assembled by a foreign affiliate (also classified under ISIC 29). The headquarters in country A also buys other parts which are needed for the manufacturing of the final product from companies that are not part of the MNE in third countries. These other parts are sent directly to the foreign affiliate in country B.

The finished product is not exported back to country A. In this production process, the headquarters in country A considers itself the owner of the inputs and the intellectual property products until the finished product is sold. In country A's foreign trade statistics, the values of the exported parts are reported without the processing fee and at a much lower value than the finished product. Neither the value of the other parts imported from third countries used in the processing nor the cost of the processing are included as imports in the trade statistics of country A. However, the finished product is invoiced from country A and the full value of the finished product is reported in the business survey as production of motor vehicles. The full value of the finished product includes the profits related to management, design, and R&D carried out in country A and the cost of the processing and parts imported from third countries.

This results in discrepancies when balancing the output and the intermediate consumption with the export and import figures. Since the foreign trade in goods statistics do not collect data according to the change of ownership principle, the NSI in country A need to contact the enterprise to obtain the data regarding the cost of processing in country B and the other parts imported directly from third countries to country B separately. Therefore, the foreign trade and the intermediate consumption figures can be adjusted in such a way that the export of country A reflects the turnover from foreign sales of completed vehicles. Imports and the intermediate consumption of country A include the processing services and the other motor vehicle parts purchased in country C. Care should be taken to also obtain data on inventories abroad.

B. Case B: Merchanting

42. Under this global production arrangement the domestic entity buys the shoe from the supplier and resells it without further transformation. The domestic entity does not provide any of the material inputs or any information to the supplier to help design the shoe. As the domestic entity purchases a good from a supplier abroad and resells that good to a customer located abroad, this activity falls under the "merchanting" case as discussed in the 2008 SNA and BPM6. The domestic entity is simply a trader that buys the shoes from the supplier in country B and sells them to a customer located in country C.

43. The key features of this arrangement are that (a) the goods never enter the domestic entity's territory while the sales are credited to the domestic entity, and (b) the physical form of the goods, while owned by the domestic entity, does not change. In other words, the domestic entity does not carry out any substantial transformation on the purchased goods.

44. In this simple case the domestic entity purchases and resells the goods abroad. The domestic entity did not own the material inputs or the intellectual property, but takes ownership of the shoes before selling them to the customer located in country C. Following the recording principles of merchanting in 2008 SNA and BPM6, the domestic entity's country records a negative export when the good is acquired and a positive export when the good is sold. The difference between the import and export value represents the trade margin received by the merchant. The details of this recording can be found in the Globalization Guide, Chapter 6.

45. Under this scenario the domestic entity is engaged in trading and classified under ISIC 46: 'Wholesale trade, except of motor vehicles and motorcycles'. As mentioned, the output of the domestic entity represents the margin on the sale. The foreign supplier is classified in the manufacturing industry (ISIC section C) and reports the full value of the shoe in its turnover.

46. One significant challenge is the recording of foreign purchases and sales as (negative) exports, as these flows may remain unobserved in merchandise trade statistics of the country where the unit performing the merchanting activities is resident. These measurement challenges are discussed in Chapter 5 of the Guide.

i. Athletic shoes example B

47. Continuing with the athletic shoe example, the domestic entity located in country A purchases the shoe from the supplier located in country B and sells the shoe to a customer located in country C. The shoe does not enter the principal's territory before being sent to country C. The domestic entity, or the principal, in country A is responsible for marketing and selling the shoe but neither controls the production process of the shoe nor owns the material inputs of production. The principal's output is the margin on selling the shoe. The

supplier in country B purchases the materials and receives the returns to the intellectual property embedded in the shoe.

Table 7
Example B1 – Production account, countries A and B

	Principal Country A Trade	Supplier Country B Manufacturing
Gross Output	**25**	**85**
Goods	0	85
Services	25	0
Intermediate inputs	**4**	**33**
Materials	0	30
Processing services	0	0
Other services	4	3
Value added	**21**	**52**
Compensation of employees	15	22
Taxes less subsidies on production	0	0
Gross operating surplus	6	30

48. Table 8 shows that the trade margin (25) represents the difference between goods acquired, and goods sold, under merchanting and is not reported as the export of a service.

Table 8
Example B1 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**25**	**85**	**0**	**110**
Goods	25	85	0	110
Net exports of goods under merchanting	25	0	0	25
Goods acquired under merchanting	-85	0	0	-85
Goods sold under merchanting	110	0	0	110
Services	0	0	0	0
Imports	**0**	**0**	**110**	**110**
Goods	0	0	110	110
Services	0	0	0	0

49. There are variations in the types of arrangements that fall under merchanting. For example, the good could be bought by the principal located in country A and sold to a customer located in the supplier's country B. If the domestic entity buys the good from the supplier in country B and subsequently sells that good to a customer located in country B then country A would record the transaction as a merchanting transaction (i.e., country A would record a negative export of a good from country B and a positive export of a good to country B). Country B would record an export of a good to country A and an import of a good from country A.

50. There are at least two important borderline cases to consider in the context of merchanting. The first is when the good under ownership of the merchant is subject to

further transformation or processing, which changes the nature of the good. In this case the entity can no longer be considered to be engaged in merchanting. Instead the unit should be treated and classified as a manufacturer. The resulting arrangement has similarities with industrial processing. The distinction between 'goods under merchanting' and 'processing services' is further illustrated in BPM6, Box 10.1.

51. The second borderline case is when the merchanting unit is engaged in the production process by providing the required knowledge such as the blueprints of the production process carried out by the supplier in country B. This case of the so-called FGPs is further explored below.

C. Case C: Factoryless goods producers (FGPs)

52. [This section will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.]

53. A FGP provides the intellectual property products to the supplier as inputs into the production process. This intellectual property reflects the "blueprints" for production. The recognition that the underlying IPP is part of the transformation process and changes the characteristics of the physical goods reflects a fundamental aspect of production in the 21st century. For example, suppose the principal creates a new and innovative midsole that improves the athletic performance of runners. The principal contracts with a supplier to make the shoe. The principal provides the supplier with the design and the specifications for making the shoe but does not provide any of the required material inputs. The supplier purchases all required materials. However, the principal is responsible for marketing and selling the shoe and receives the revenue. In addition the principal may be involved in identifying key material inputs and monitoring the quality of material inputs as well as being.

54. A FGP controls the delivery of its products to consumers. The supplier delivers predefined products to the principal at predetermined prices and cannot sell its output to parties other than the principal. A FGP may provide substantial inputs in the form of R&D and other intellectual property embedded in the good. These intangible inputs may contribute substantially to the value of the finished product. Because the return on the intellectual property embedded in the good is received by the FGP (and not the supplier) the margin on the sale of the good is higher than purely a trade margin associated with distributing the goods. As seen in Linden et al. (2007) in "iPod" case study, a large part of the wholesale value represents the return on the intellectual property and design.[2]

55. As explained in Section II, determining the output and the industry classification of this type of producer is not straightforward. The recommended treatment in this Guide is to regard FGPs as a special category of manufacturers. The numerical example below follows this recommended interpretation of a FGP arrangement.

1. Athletic shoes example C1

56. Continuing with the athletic shoe example, the principal in country A outsources the transformation of its athletic shoe to a foreign supplier located in country B. The principal controls the production of the shoe by providing the supplier the blueprints of production. The principal maintains ownership of the intellectual property embedded in the shoe as well

[2] Linden, G., K.L. Kraemer, & J. Dedrick (2007) "Who Captures Value in a Global Innovation System? The case of Apple's iPod." UC Irvine: Personal Computing Industry Center (http://escholarship.org/uc/item/1770046n)

as being responsible for marketing and selling the shoe. The supplier purchases the materials (according to the specifications of the principal) and the principal acquires the shoe at the factory gate price *including* the materials plus the value of the processing (compensation of the production workers) but *excluding* any value associated with the use of IPPs in this production process.

57. [The guidance on recording the transactions between the FGP and the contractor will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.].

Country case study 2.2
Factoryless Semiconductor Producers

This case study originates from a country with a relatively large number of factoryless semiconductor producers. According to the Global Semiconductor Alliance, factoryless semiconductor producers are called "fabless" because "Fabless refers to the business methodology of outsourcing the manufacturing of silicon wafers. Fabless companies focus on the design, development and marketing of their products and form alliances with silicon wafer manufacturers, or foundries." Foundries are typically located in Asia because the generally low cost of labor, so fabless companies can benefit from lower production costs while concentrating their research and development resources on the end market.

In the case study country, referred to as country A, a typical fabless semiconductor enterprise has a management unit and a large R&D unit. During the development of the design, the testing of the semiconductor is performed at the enterprise of a subcontractor, often situated in another country. At later stages the production is also performed by sub-contractors outside the territory of country A.

An example of such a factoryless semiconductor enterprise in the case study country is a fabless enterprise designing and marketing finished products worth about a quarter of a billion dollars, which are produced by non-affiliated enterprises in an Asian country. The income of the domestic enterprise in country A amounts to about 35% of the output value. The share of the domestic enterprise in the combined added value is quite high and may be assumed to reflect mainly the value of R&D performed within country A. In its financial reports the domestic enterprise registers the whole value of the sales of the final production as domestic income, so that on the one hand it is easy to collect many of the gross data needed to analyse all production processes in the global value chain. However, on the other hand, in order to separate the activities between the countries, one has to collect data on the transactions taking place between the domestic enterprise, the producers abroad, and the customers, since no movement of goods has been observed in the foreign trade data, and the transfer of R&D to be used in the outsourced production also has not been recorded.

2. Branding

58. [The guidance on the exact scope of FGP activities will be further elaborated upon finalization of the consultation with the UN Expert Group on International Statistical Classifications.].

59. A FGP could be involved in a combination of activities such as branding and outsourcing the transformation of a good that the firm designed. One such firm, a computer producer, utilizes a significant number of unaffiliated contractors around the world to manufacture products that has been designed by the firm. The firm uses multiple contractors to maintain flexibility in their supply chain and manufacturing process thereby generating cost efficiencies and reducing time to market for own-designed products. In

addition, the computer firm's financial statements indicate the firm also purchases original manufactured products from third-party producers and resell these products under the firm's own-brand name.

60. The stylized arrangements discussed in this section are simplified versions of actual global production arrangements that can be very elaborate. The discussion above illustrates that a firm might use a combination of types of global production arrangements and statistical offices may have difficulty distinguishing between a producer that is only branding products and a producer that provides the blueprints of the production process, thus exhibiting control over the production process. These borderline cases are further examined in Chapter 5 of the Guide.

3. IPP services

61. The intellectual property inputs in global production arrangements may also be provided by entities other than FGPs. For example, companies specialised in R&D may supply their knowledge inputs without being engaged in the production of goods. Suppose an entity creates a new and innovative midsole that improves the athletic performance of runners. The entity sells the rights to use the design and the specifications for making the shoe to a shoe manufacturer which is also responsible for marketing and selling the shoe and receives the revenue. The research and development (R&D) supplier receives revenue from selling or licensing the design and should not be seen as the principal arranging an international supply chain to make a particular good or service. It is simply a participant in the supply chain that is responsible for supplying the intellectual property products.

4. Athletic shoes example C2

62. Continuing with the athletic shoe examples, a unit in country A is transferring the rights to use the design and blueprints of how to make the shoe to a manufacturer in Country B in return for a fee. The manufacturer in Country B transforms the shoe and is responsible for marketing and selling the shoe and records the full value of the shoe in its turnover, including the IPP service fee embedded in the shoe. Tables 11 and 12 show that the company in Country A exports the IPP service fee to Country B. All other production takes place in country B under the full responsibility and ownership of the shoe manufacturer.

Table 11
Example C2 – Production account, countries A and B

	Country A R&D provider	*Country B Manufacturer*
Gross Output	**30**	**110**
Goods	0	110
Services	30	0
Intermediate inputs	**0**	**67**
Materials	0	30
Processing services	0	0
Other services	0	37
Value added	**30**	**43**
Compensation **of employees**	0	37
Taxes **less subsidies** on production and imports	0	
Gross operating surplus	30	6

Table 12
Example C2 – International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**30**	**110**	**0**	**140**
Goods	0	110	0	110
Services **(use of intellectual property)**	30	0	0	30
Imports	**0**	**30**	**110**	**140**
Goods	0	0	110	110
Services **(use of intellectual property)**	0	30	0	30

D. Services related global production arrangements

63. Firms may contract with other firms to provide support activities such as billing services or information "helpdesk" services. Contracting these kinds of services is quite common. However, the arrangements presented in this subsection deal with firms whose primary activity is the production of services. These firms may fragment part of their services production to different countries or may even fully outsource, or subcontract, the provision of their services to non-affiliated companies abroad.

64. There is a subtle distinction between fragmenting part of the production and fully outsourcing production. Fragmenting implies that the domestic entity remains in control of the production of the primary service product, and incorporates that part that was fragmented into the product. Full subcontracting of the production of services means that the principal entity acts as a services arranger, who bundles and manages the services of the subcontractor(s) on behalf of customers.[3] The main distinction between these two types of arrangements is whether the domestic entity contributes to the production of the primary service product versus fully subcontracting out the production of the primary service product.

E. Case D: Fragmenting the production of services, Intellectual Property Products (IPPs)

65. In this case, the domestic entity remains in control of the production process and owns the intellectual property used in production, as well as the intellectual property as output of the production process. For example, a software firm in Country A receives a contract to design customized software for another company in country B.[4] The software firm in country A employs computer programmers in-house to write the application, but also employs computer programmers located in country C to develop certain features of its application. The principal, the domestic software firm located in country A, owns the proprietary rights to the software being developed and is simply paying the supplier in country C a fee for providing the service.

66. Both the principal and the supplier are classified in the appropriate service industry. In the case of software development, both the principal and supplier are classified in the ISIC Division 62: Computer programming, consultancy and related activities.

[3] Manual on Statistics of International Trade in Services (MSITS) 2010 paragraph 3.61 – 3.62.

[4] The customer could be located in the domestic entity's country—country A— or be located in the country of the supplier—country B.

F. Case E: Fragmenting part of the production of services, excluding IPPs

67. In this case, the domestic entity remains in control of the production process and owns the output associated with the service produced and no services are related to IPP.

68. For example, an accounting firm in country A receives a contract from a company in country A to audit the company's financial statements. The company has a subsidiary in country B. The domestic accounting firm in country A uses domestic employees to perform auditing services of the unit located in country A. Because in many parts of the world accounting firms are required by law to be locally owned and independent, the accounting firm in country A must contract with another accounting firm in country B, where the subsidiary is located, to perform the auditing service for the subsidiary's financial statements.

69. The accounting firm in country A provides auditing services to the company located in country A and receives the revenue directly from the customer located in country A. However, there is an international transaction involved to account for the purchase of auditing services by the accounting firm in country A from an accounting firm in country B. In this example both the principal and the supplier are classified in ISIC Division 69: Legal and accounting activities industry.

G. Case F: Subcontracting production of services

70. Under this global production arrangement, the principal may outsource (part of) its services provision. Under certain conditions, such an arrangement could be considered in some ways similar to merchanting of goods, particularly when the services are purchased and resold without any significant transformation. The issue of merchanting of services and its relationship to subcontracting is further discussed in Chapter 10 of the Guide.

71. For example, a principal unit is paid to provide custom software services to a non-resident customer. The principal subcontracts to a non-resident contractor to provide the required custom software services. The principal pays the non-resident contractor to obtain ownership of the developed software and subsequently resells this software to the non-resident customer. The principal records the revenue received from the non-resident customer (recorded as exports of software services) and the expenditure for purchasing the custom software from the non-resident contractor (recorded as imports of software services).

72. The value of services exported and imported in the economy of the principal is recorded on a gross basis. This treatment is applicable because the principal buys and sells the services. In case the principal acts on a commission basis (i.e., not taking ownership of the software), then only the commission would be recorded as the service provided by the principal. Both the principal and the supplier are classified in the appropriate service industry of their primary activity, which in this case are ISIC Division 62: Computer programming, consultancy and related activities.

1. Direct investment enterprises, holding companies and head offices

73. The last production arrangements include direct investment enterprises that are themselves not directly engaged in the production of goods or services. Purely direct (foreign) investors are not engaged in production at all. The returns on their investments are recorded as property income (dividends) in the distribution of income accounts. The owners of foreign enterprises may be engaged in the production activities in at least two ways.

74. Head offices (ISIC Rev. 4, section M, class 7010) may oversee and manage the activities of (foreign) subsidiaries by undertaking the strategic or organizational planning and decision making role of the company or enterprise; exercising operational control and manage the day-to-day operations of their related units.

75. Holding companies (ISIC Rev. 4 in section K, class 6420) hold the assets of subsidiary corporations but do not undertake any management activities. They are described as units that hold the assets (owning controlling-levels of equity) of a group of subsidiary corporations and whose principal activity is owning the group. The holding companies in this class do not provide any other service to the enterprises in which the equity is held, i.e. they do not administer or manage other units.

76. Both head offices and holding companies generate output in the form of managerial or financial services. These services are expected to be mostly consumed by the foreign subsidiaries and this may give rise to international transactions, i.e. the export and import of managerial and financial services. In theory these services add up to the other inputs of production of the foreign subsidiaries. In any case the output of the ultimate production process is reported in the country in which the subsidiaries are resident.

IV. Conclusions and recommendations

77. The stylized arrangements discussed and illustrated in this chapter are simplified versions of actual global production arrangements that can be very elaborate. A multinational enterprise can consist of many units producing an array of products across several countries and the accompanying accounting relationships can be complex. In such situations the lines between the various types of production arrangements can become blurred.

78. The main objective of the typology is to support the proper breakdown of economic activities along the global supply chain on a country-by-country basis. Guidance on the recording of each type of global production arrangement is provided in the chapters that follow.

79. The following recommendations can be extracted from the discussions in Chapter 2 of the Guide:

(a) Table 1 should be used as a 'roadmap' to assist the translation of complex real life global production cases into recognisable schemes from which the main accounting principles can be derived. Updating this table may be needed to keep track of newly emerging forms of global production arrangements (particularly in the area of services).

(b) In the case of processing or manufacturing services on physical inputs owned by others (case A), the manufacturing service fee could include (substantial amounts of) cost of materials purchased by the processor. The processing arrangement refers to all processing done by a supplier on goods owned by others.

(c) When a good under ownership of an entity performing a merchanting function is subject to further transformation or processing, which changes the nature of the good, the entity can no longer be considered to be engaged in merchanting. Instead the entity should be treated and classified as a manufacturer. The resulting recording is similar to that of goods for processing.

(d) FGPs control the supply chain, the blueprints of production, access to customers, trademarks, and other sources of significant value embodied in the final output. The contractor generally only manages the processing activities by strictly following the specifications provided by the principal. A key characteristic of the contractual arrangement

is the captive nature of the contractor. The contractor's production activities cannot be undertaken without the blueprints provided by the principal.

The following two criteria are recommended to identify a FGP:

- Control over the outcome of a production process;
- Ownership and provision of IPP inputs.

(e) According to these criteria, the following supplementary guidelines should be used to determine the industry classification of FGPs: A principal that owns, or obtains a license to use, and supplies IPP inputs but no material inputs to a contractor but still manages (controls) the overall outcome of the production process should be classified to the manufacturing industry in a separate subset of existing classifications that highlights the factoryless characteristics of the firm.

(f) A principal that supplies no IPP or other inputs (goods and services) to a contractor should be classified to trade.